RESPONSE TO ARGUMENTS

Applicant acknowledges that his arguments with respect to claims 52 and 78 have been considered, but are moot in view of the new ground(s) of rejection.

RESPONSE TO 35 USC § 112 REJECTIONS

In drafting the claims herein, applicant has made a conscientious and diligent effort to overcome the Office Action's allegations that previous pending claims 52 and 78 were narrative in form and replete with indefinite and functional or operational language. Specifically, the claims now recite proper structural elements, and each claim presents a complete and operative device. Single-sentence form has also been observed in every claim.

The cited reference to the term "adapted" in previous pending claims 52 and 78, lines 1 and 2, has been eliminated and, as one non-limiting example, a recitation of specific "interconnecting means" now clearly recites structural elements from the Drawings and Description.

Applicant brings the Examiner's attention the submitted Independent Claims, which may at first glance appear as undue multiplicity and repetitious claims. As will be apparent in reading each claim, there are key differentiators which distinguish each Independent Claim.

Applicant's Description and Drawings provide multiple program instructions and computations which resolve in an operative claimed invention, as well as multiple arrangements of physical elements of the invention. The following are non-limiting examples:

- Claim 109 specifically recites "predetermined computations based on acquired and memorized voltage values," which includes either/both

memorized Vmin and/or Vmax voltage values and, according to the Description, the predetermined computations therefrom can include *"Vmax + Vmin ÷ 2 = Vout"* (page 75) and/or *"Vmax - 1 Volt = Vout"* (page 93). The claim also recites "determining an anticipated fully-charged battery voltage" which, based on the Description and Drawings, points toward at least one of the look-up tables (Fig. 15, for example). But, the use of a look-up table does not necessarily invalidate the use of either (or both) of the two cited computations as an analyzing means for "producing an output voltage of the configurable power supply."

- Claim 114, in comparing it to claim 109 in order to further substantiate that each of the submitted Independent Claims differs from the others, makes no reference to the "anticipated fully-charged battery voltage" recited in claim 109. Thus, claim 114 is limited to only "predetermined computations based on acquired voltage values" in order to produce "an output voltage value of the configurable power supply." Thus, in this non-limiting example, claim 114 can include *"Vmax + Vmin ÷ 2 = Vout"* and/or *"Vmax - 1 Volt = Vout"* as predetermined computations, and it can be further argued that the claim might not point to a look-up table, as does claim 109.

- To further substantiate that the submitted Independent Claims are not unduly repetitive, comparing claim 122 to claim 109, claim 122 recites "predetermined computations based on acquired voltage sag and fully-charged battery voltage values," which can limit the scope of the claim to covering only the use of a look-up table as a means of arriving at a "fully-charged battery voltage," since "voltage sag" is recited. Therefore, it can be argued that neither of the two computations cited above in reference to claim 109 are relied on in claim 122 as a means of "determining an output voltage for the configurable power supply." Claim 125 is a method claim, roughly analogous to claim 122.

- Claim 155 is a claim which differentiates in its reciting data communicated between two elements of a system, and it compares to claim 109 and the other claims cited above by reciting in the preamble "an output of a configurable power supply based on data acquired by previously accessing a battery." In relying on the Description, the acquired data can not only be from non-limiting examples such as:

   ◆ preloading a battery: "An external power source (such as hardware assembly 100 in Fig. 2, or power box 400 in Fig. 13A) can read the actual voltage (both load and no-load) of battery cell(s) 182." (Page 53)

   ◆ directly accessing a smart battery: "The communications link between external adapter assembly 400A also extends to communicating with a smart battery 134, so that the smart battery can communicate data such as the battery manufacturer's design voltage, remaining battery capacity, etc." (Page 5)

   ◆ acquiring data as to either (or both) Vmax and/or Vmin voltages: "Software 101 and 800 use both a Vmin voltage (under load), and a Vmax (no load). A suitable resistive load is applied in the external power supply to allow a Vmin voltage reading." **(Page 37)**

   These are just a few of the more obvious non-limiting examples.

The above-cited non-limiting examples are not the only differentiators among the claims. Applicant has, by the above example of the "analyzing means" clauses of each claim, shown language in the claims that now clearly define the invention.

The remaining Independent claims 125, 128, 134, 144, 164 and 167 are not compared here because:

- Claim 128 is directed to a means of preloading a battery, which recites the interconnecting of elements of an interface which resolves in a preloading of the battery

- Claims 134 and 144 are unique and distinguishable by reciting a manually-configurable power supply

- Claims 164 and 167 are currently amended to correct the cited deficiencies in the previously pending claims 52 and 78 respectively that are addressed in the subject Office Action as rejected under 35 USC § 112.

The non-limiting examples cited above are to argue the issue of undue multiplicity and repetition of claims. Applicant's intent in the above discussion is not to interpret any claim, or any element therein, in a way that limits the scope of the claimed invention.

The Description and Drawings do support a number of means, and the language of each Independent Claim does effectively limit the scope, as well as define the meets and bounds, of applicant's claimed invention.

Applicant submits that the Office Action's objections under USC 35 § 112 (second paragraph) have been overcome, and that the distinctions are of patentable merit and that the claims presented here move forward to allowance.

RESPONSE TO 35 USC § 102 REJECTION

The Office Action alleges that applicant's claims 52, 78, 89, 90, and 99 are rejected under 35 U.S.C. 102(e) as being anticipated by Takahashi (US 6,150,823).

Applicant argues that the new Independent Claims submitted herein fully overcome the allegations and basis of the Office Action's rejection. The office action cites its rejection as based on Independent Claims 52 and 78 being "so broad as to read in Takahashi." Applicant, in the new Independent Claims submitted herein, has narrowed the claims to better clarify and point out distinct differences between the prior art and applicant's claimed invention.

Specifically, applicant's claims now recite a "previously unknown battery-powered device," while Takahashi teaches that "a certain device is known" (Col. 2, lines 10-11). Applicant's use of "previously unknown device" is supported by the following references in the Description:

- "The load-value for this state is not fully known. It cannot be, because software 800 and its associated hardware have no determination capabilities of whether it has interacted with this specific powered device 508C. Every powered device will exhibit different load values, resulting from the impedance of circuits inside the powered device 508C (downstream of battery pack 508B)." (Page 119, lines 9-13)

- "Thus, an external power-conversion adapter assembly 400A can replace (or enhance the proper operation of) a variety of commonly available power adapters, with a single "one-size-fits-all" adapter that is used with a multiplicity of powered devices." (Page 8, lines 2-4)

- "A template of a BIOS POST in Fig. 19 can be implemented in software 101, which is used to identify the type of powered device being powered." (Page 90, lines 24-26)

- "By performing these functions in software, the need for a user to know anything about the power requirements of a host device is eliminated." (Page 81, lines 15-16)

While applicant's rewritten claims now clearly differentiate the subject claimed invention from the teachings of Takahashi, applicant herein presents for the record the following reasoned arguments to further support changes made in the subject claims, as well as to provide information relevant to the Office Action's rejection under USC 35 § 102:

1. Takahashi solves a different problem than that of applicant's claimed invention. He defines his field of invention as relating to "a remaining-amount-of-battery detecting device for detecting the remaining amount of battery power." (Col. 1, lines 11-13) More specifically, his only objective in reference to a battery as a source of power for a device is to "determine whether a power source used is a battery by means of a simple arrangement so that an erroneous display of the remaining amount of battery power can be prevented." (Col. 4, lines 49-51)

   Applicant's Description recites a field of invention totally different from Takahashi's, namely "The invention relates to software, specifically to such software that interacts with hardware assemblies to configure an optimized power signal that is delivered to a powered device" (Page 1, lines 21-22). Thus, the Office Action applies a strained interpretation of Takahashi, and does not acknowledge he is solving a totally different problem than applicant's claimed invention.

2. Takahashi does not teach an <u>automatically configurable or manually-selectable</u> power supply. His "A/C adapter" has a fixed-voltage output. FIG. 41 validates this, showing a dashed line 662 representing the fixed output voltage of his adapter to be 7.2 Volts.

More to the point of his invention, that adapter already exists as a peripheral that is voltage-matched to the input voltage of his powered device -- essentially it is an element of prior art that is known to Takahashi, and is not an item which he invented. Takahashi nowhere states that he invented an A/C Adapter 635 (FIG. 39). He does not teach how to build his power supply, but only shows that an existing adapter 635 in his FIG. 6 should have an output voltage compatible with the open-circuit voltage of his battery, i.e., 7.2 Volts, which is what his FIG. 41 clearly shows.

Applicant's claimed invention specifically is defined in the Summary of the Invention as ". . .electronic processor assisted methods for a hardware assemblies and related software to acquire and analyze information about the power requirements of a powered device, then to configure a power source (which may be embedded, or external) to deliver an optimized power signal to said powered device" (Page 2, lines 4-7).

Therefore, Takahashi does not anticipate applicant's claimed invention because he teaches a different power supply than does applicant.

3. The Office Action's cites a reference to Takahashi, that "Although the ninth embodiment is arranged in such a manner that the battery 634 or the AC adapter 635 is selected by the switch 636, it is also possible to adopt an arrangement in which an AC adapter is connected in parallel to a secondary battery so that electrical power is supplied from the adapter to the camera unit or the VTR unit 632 while the battery is being charged" (Col. 27, lines 51-58). But, this reference is vague and makes no enabling disclosure because it only suggests a

possibility. The cited reference to his Fig. 39 does not illustrate any such arrangement, and his text does not fully recite sufficient specific information in a manner that defines a complete operative device.

Further, since the cited prior art is relied on in the Office Action by the specific above-quoted reference, applicant overcomes the allegation by the fact that applicant's claimed invention does not recite simultaneous battery charging. Applicant's description states: "Since software 101 (and 800), with associated hardware, are designed to disable battery charging functions. . ." (page 82, lines 30-31). Thus, by applicant reciting a power supply delivering power to a device in a way that does not charge the battery, as compared to the prior art which specifically teaches that power is delivered to a device while the battery is being charged, this clear and obvious difference in the two systems is sufficient to overcome any anticipation of applicant's claimed invention by Takahashi.

4. Takahashi requires a user-manipulated switch 636 (FIG. 39) in order to select either battery 634, or AC adapter 635 (Col. 25, lines 1-10). Applicant does not recite such a switch. Applicant does teach a user-manipulable connector (see FIGS. 6-6F-1 and in the sections "Power Connector" and "Connector Operations" of the Description on Pages 36-38, *et passim*), but that interface in one modality provides the power supply access to the battery, while the prior art's switch does not cause such an electrical coupling. Therefore, applicant's claimed invention is superior to the prior art by providing a simple connecting means for an attachable external power supply to access a battery and, by doing so, to provide a capability to build the software and related hardware into a low-cost free-standing modular unit that is easily replaceable.

5. Takahashi teaches a removable battery with an internal resistor. Applicant's software, calculations, equations, and algorithms do not recite a fixed-value resistor electrically attached to every battery. Takahashi teaches battery loading for the purpose of acquiring (using an ammeter) current-based values from which

he computes remaining battery capacity: "Resistors 12 and 14, each of which has a known resistance, are selectively connected to the battery 10 by a switch 16. An ammeter 18 is arranged to output a current signal by measuring a current flowing through the resistor 12 or 14 when the resistor 12 or 14 is connected to the battery 10. An A/D converter 20 digitizes the value of the current measured by the ammeter 18." (Col. 7, lines 3-9) Applicant's claims recite battery loading for the purpose of acquiring voltage-based values "using techniques similar to that of a volt meter." (Page 18, line 18)

6. In regard to his "open-circuit" battery voltage cited in the Office Action, Takahashi teaches that " However, since the value of the open-circuit voltage v does not vary with the load current because the internal impedance is zero, it is possible to perform accurate measurement of the remaining amount of battery power" (Col. 16, lines 10-14). On page 87 of applicant's Description, it states that, although Ni-Cad and Ni-MH chemistry batteries produce "not very pronounced" changes in impedance, Li-Ion does exhibit "clearly defined impedance changes that track with decreases in voltages." Applicant's contrarian view clearly differentiates the basis of the subject claims as to reciting a "fully-charged battery voltage," versus Takahashi's teaching an "open-circuit voltage." Applicant's claimed invention is superior to Takahashi because it recites a more valid and correct method of determining an anticipated maximum battery voltage.

7. In the overview of the prior art references cited in the OA as anticipating applicant's claims, the parallels or equivalents in the cited references are presented in a way that merely suggests that the subject claims and the prior art correspond. Takahashi teaches nine different embodiments of his invention, and the OA cites isolated references from several of these embodiments out of context, then connects them in a way which intimates that the combination of such disparate prior art references anticipates the totality of applicant's subject claim. By portraying these disjointed prior art references as inter-related, a sequence of superficially comparable functions and operations is artifacted in

order to validate the 102 objection. For example, **Table A** (attached hereto as "Exhibit A") shows the full text of the Office Action's cited references juxtaposed with the actual text of applicant's original claim, and relevant text from each of the prior art's nine embodiments of the invention.

The third column listing Takahashi's numerous embodiments highlights how diverse the cited references are upon which the Office Action based its allegations. The matter quoted along with each embodiment points out the context in which the Office Action's referenced text quoted in the first column appeared in Takahashi's Description. Other references from the prior art are also included in the third column to put the cited references of the first column into context, so as to show that the prior art does not anticipate the subject claims. By paying attention to the diverse embodiments, in conjunction with the textual citations in the third column, it is apparent that the references in the first column cited as reading on applicant's original claim (center column text in **Table A**) are quite different from the context represented in the Office Action.

As can be further seen in attached **Table A**, each of the cited prior art references in the first column appear to have a superficial similarity to the language in applicant's original claim. Yet, when put into their proper context as Takahashi taught the operations/functions of various embodiments of his invention, each specific cited reference and its context do not match the correlated element of the subject claim. The question must be asked: Does every cited prior art reference truly anticipate the indicated clause in applicant's claim?

For example, applicant's "varying said resistive load on said battery" is, out of context, generally the same Takahashi's "A load circuit 132 has a resistance which varies." But, that is where the similarity ends, since the prior art continues to teach that the resistance varies "with the operating state" of a fourth embodiment of a video camera's "remaining-amount-of-battery detecting device." Applicant's claimed invention varies a resistive load for

detecting battery voltage sag, then "analyzing said detected voltage sag and determining the anticipated full-charged battery voltage." Thus, while the generalization that both the prior art and applicant's claim vary a resistive load seems valid, when put in context the relevance of why the battery preloading is performed -- and the divergent outcomes therefrom -- are quite different. Takahashi teaches preloading a battery as a way to determine remaining battery capacity, while applicant's claimed invention recites preloading as a way to determine the fully-charged voltage of a battery.

While the Examiner has every right to interpret the language of a claim in any reasonable way, such latitude should not extend to situations such as this wherein the prior art's field of invention is so distinguishably different from applicant's. Takahashi is obviously solving a different problem: specifically, a way of more accurately monitoring the battery run time of a known device, then displaying the remaining battery capacity on a display. The prior art does not teach what the Office Action relies on to support its allegations.

As **Table A** shows, weaving together disparate and merely coincidental phrases from prior art that is only superficially pertinent results in a strained interpretation of the referenced prior art.

With respect to Dependent Claims 89, 90, and 99 in the Office Action:

- Claim 89 is herein submitted a previously presented, and now is dependent on Independent Claim 155. Applicant has made a diligent search of Takahashi's Description and finds no specific reference to the term "embedded." In searching for equivalents, the term "integrated" appears only the context of "FIG. 1 shows an example of an arrangement in which the remaining-amount-of-battery display is applied to a camera-integrated video tape recorder (or camcorder)" (Col. 2, lines 16-19). The cited Figs. 2, 6, 11, and 13 of the Office Action show nothing of significance to support the allegation that Takahashi specifically teaches that his computer readable

medium is actually embedded, or that his program instructions are written to operate in an embedded environment.

Applicant's Description clearly and unambiguously asserts "embedded" in stating: "According to the present invention, electronic processor assisted methods for hardware assemblies and related software to acquire and analyze information about power the requirements of a powered device, then to configure a power source (which may be embedded, or external) to deliver an optimized power signal to said powered device." (Page 2, lines 4-7)

Further, Dependent Claim 89 incorporates all the subject matter of claim 155 and adds additional subject matter which makes it *a fortiori* and independently patentable.

- Claim 90 is herein submitted as previously presented, and now is dependent on Independent Claim 155. Figs. 2, 6, 11, and 13 cited in the Office Action provide no support for the allegation that Takahashi teaches that his computer readable is incorporated into a battery pack, instead of a configurable power supply. Actually, Figs. 2 and 6 show a battery 10 and 30 respectively in dashed-line form, indicating prior art. Applicant's search of Takahashi's Description resolves in finding no reference whatsoever of his computer readable medium (or any equivalent) being incorporated into either a power supply or a battery pack.

Applicant's Description states that "The hardware and software of a power box 400 can even be integrated into a battery pack, as indicated in Fig. 10, which would result in either the elimination of any external adapters at all. . . ," (Page 7, lines 30-31).

Dependent Claim 90 incorporates all the subject matter of claim 155 and adds additional subject matter which makes it *a fortiori* and independently patentable.

- Claim 99 is herein submitted as previously presented, and now is dependent on Independent Claim 167.

The subject claim recites "at least one of one or more resistive elements is a power resistor having an impedance value substantial enough to simulate an operational load of said powered device."

By comparison, Takahashi teaches that "there is provided a remaining-amount-of-battery detecting device for detecting the remaining amount of battery power, which is provided with open-circuit-voltage calculating means, including a plurality of kinds of operating states having different load resistances, for calculating the open-circuit voltage of a battery from the outputs of the battery which are detected after and before a change from one operating mode to another. . . ," (Col. 3, lines 33-40)

It has been argued and shown above that Takahashi's invention is premised on a pre-known device, while applicant's claimed invention recites a previously unknown device. On that basis, and adding to it the issue that Dependent Claim 99 incorporates all the subject matter of claim 167 -- especially the preamble which specifically limits its claimed device to being "previously unknown" -- the additional subject matter of claim 99 is not anticipated by Takahashi.

Given all of the above, the Office Action has not put forth a convincing argument as to why, on the whole, applicant's claims read on the prior art. Further, Applicant has made a diligent effort in amending previously pending claims 52 and 78 to comply with the Office Action in regards to 35 USC § 112 and to overcome the rejections under 35 USC § 102. If the examiner agrees, but does not feel that the proposed amended claims are technically adequate, applicant respectfully requests that the Examiner write acceptable claims pursuant to MPEP 707.07(j).

Therefore, applicant submits that the above reasoned arguments as to applicant's claims, and the amended claims have overcome the rejections under 35 USC § 112 (second paragraph) as well as 35 USC § 102(e), and that the claims submitted herein be given reconsideration as allowable over the cited references, then be moved forward to allowance.

RESPONSE TO ALLOWABLE SUBJECT MATTER

With respect to item 4 of the subject Office Action, the objection to dependent claims 79, 93, 97, 103, 80-88, 91-92, 94-96, 98, 100-102, and 104-108 as being dependent upon a rejected base claim has been overcome by applicant submitting herein new Independent Claims which are drafted to overcome the rejections stated in the Office Action and, thereby, providing proper base claims for the subject dependent claims.

For the record:

Claims 79, and 91-92 are now cancelled.

Claims 80-88 are herein resubmitted as follows:

> Claims 80 and 81 are previously presented, and are now dependent on new Independent Claim 164.

> Claim 82 appears twice as previously presented, one being dependent on new Independent Claim 134, and the second being dependent on new Independent Claim 164.

> Claim 83 is previously presented, and is now dependent on new Independent Claim 134.

> Claims 84 and 86 are currently amended, and are now dependent on new Independent Claim 122.

Claim 85 is previously presented, and is now dependent on new Independent Claim 122.

Claim 87 is currently amended, and is now dependent on new Independent Claim 155.

Claim 88 is currently amended, and is now dependent on new Independent Claim 125.

Claim 93 is herein resubmitted as currently amended, and is now dependent on new Independent Claim 164.

Claims 94-96 are herein resubmitted as previously presented, and are now dependent on new Independent Claim 164.

Claim 97 is herein resubmitted as currently amended, and is now dependent on new Independent Claim 167.

Claim 98 is herein resubmitted as previously presented, and is now dependent on new Independent Claim 167.

Claims 100-102 are herein resubmitted as previously presented, and are now dependent on new Independent Claim 167.

Claim 103 is herein resubmitted as currently amended, and is now dependent on new Independent Claim 167.

Claims 104-108 are herein resubmitted as previously presented, and are now dependent on new Independent Claim 167.

By providing new Independent Claims 122, 125, 134, 155, 164 and 167 as proper base claims, applicant has overcome the objection the above claims as being dependent on a rejected base claim. Therefore, applicant requests reconsideration of these claims as patentable and being in proper order for allowance.

IN THE SPECIFICATION

Applicant herein submits the following amendments to the specification. The following amendments are of a minor nature. No new matter has been added, and the amendments fall completely within the scope of the material set out in the originally filed documents.

Please amend the specification as follows:

Page 6, lines 29-32 — Page 7, lines 1-9

"Universal" power adapters are available in the marketplace. Radio Shack, for example, stocks power adapters with ~~delectable~~ selectable voltage dials, so that a user can manually set an output from as many as six voltages. Other adapter vendors, such as Targus, and Nesco (Van Nuys, CA), offer so-called "universal" adapters that require a user to mate a particular connector tip (or power cord/tip assembly), in order to achieve a particular output voltage. While these devices may offer some slight cost savings over dedicated, device-specific power adapters, they can hardly be considered universal. Not all connector tips offered by Targus, for example, cover the over 250 models of laptop computers in the marketplace (Targus claims compatibility with only IBM, Toshiba and Compaq). Both the Targus interchangeable connector tips, and the Nesco "smart" power cords suffer from the already-identified problem of power connectors that mechanically are interchangeable among a variety of non-voltage-compatible devices, so a user is still faced with the problem of configuring the power adapter in a way that results in an incorrect voltage being delivered to a particular laptop.

Page 16, lines 27-31 — Page 17 lines 1-2

Figs. 13 and 13A illustrate non-limiting examples of a self-confirming power adapter 335B and 400 respectively that is comprised of at least one signaling indicator that can be an LED 402. LED 402 is wired so that it blinks during voltage selection, then

lights solid ON when a voltage match is achieved. This indicates to a user that a powered device's voltage, determined by software 800 in Fig. 1A is the same as the selected output voltage of adapter 400 at voltage selector 337. As a safety measure, the tool used to rotate selector indicator 504 is a male "key" connector 404. Connector 404 in Fig. 13 is shown in Fig. 6D as connector 540.

Page 18, lines 1-14

An adjusted voltage value, defined by software 800 (Fig. 1A) is sent form MCU 102A in Fig. 13A to power ~~supply~~ converter 122A, along multi-conductor control line 510. Power converter 122A's resistor ladder (indicated in Fig. 4 as assembly 160) corresponds to binary values expressed by selector 337.

Once power ~~supply~~ converter 122A has configured its Vout, as commanded by MCU 102A, A/D lines 525 and 527 read power ~~supply~~ converter 122A's Vout. Software 800 (Fig. 1A) and MCU 102A then apply a resistive load 517 to power ~~supply~~ converter 122A's output, ~~top~~ to test the integrity of the power settings. If monitored Vout shows negligible voltage sag under load, and having confirmed that power supply's Vout matches the desired voltage value stored in memory 518A, MCU 102A then closes switches 526 and 526A, allowing power to flow along powerlines 523 and 524 to connector 132, and into battery 508B. The sections "Power Connector," "Connector Operations," and "Diode UPS" explain how a connector 132 reroutes power-delivery lines within battery 508B to bypass the internal battery cell(s), and deliver power to a powered device 508C.

Page 19, Lines 28-32 — Page 20, lines 1-9

2) Data port 406A in power box 400 (Fig. 13A) is used to connect a power box 400 to a powered device 508C. Figs. 13 and 10 depict a power adapter that has a data I/O port 406, which attaches to a mating data port on a powered device, shown in a non-limiting example as a laptop computer 349. This data link allows a communications-enabled external power adapter/module 335 (Fig. 10), 335B (Fig.

13), or 347 (integrated into a battery as in Fig. 10) to access a powered device 508C's data storage, memory, and software applications, or even the operating system to either acquire power-related information from the powered device, or to share information acquired by the adapter/module with the various hardware/software within the powered device. As such, elements of software 101 and 800 (Figs 1 and 1A) relevant to inter-device or network communications can be stored on diskettes, CD-ROMs, DVDs, etc., as appropriate for use with powered devices, servers, embedded LAN nodes, and the like. A non-limiting example of a use for this external adapter/module-to-powered-device comm communications link can be to indicate with a screen prompt on the powered device that selector dial 504 is incorrectly positioned (this assumes that the powered device is turned ON and operating from battery power).

Page 26, lines 5-24

Other Power Supply Modalities

"Configurable" power supplies are not limited to auto-configurable, or selector-controlled manually-configurable modalities, as described above. User configuration can include a function as simple as choosing the appropriate power supply from a number available. A corporate Manager of Information Systems (MIS) may, for example, need to confirm that the one of a number of identical-looking power supplies available in a spares bin is the correct voltage match for a particular powered device. Software 800 in Fig. 1A operates to confirm the proper voltage required, and can also, with a hardware device 335 (Fig. 10), or 357 in Fig. 11, interface with a pre-manufactured, fixed-output-voltage power adapter.

A separate module 357 in Fig. 11 can interface between a powered device's battery pack and an independent power supply. The function of this module is to acquire a battery 355's voltage, using software 800 in Fig. 1A, and to compare the acquired voltage information from battery 355 to configure the fixed-output voltage of a power supply 335A. Module 357 cannot use software 800, but can employ a simple hardware voltage comparator. Module 357 can also be a more versatile data

acquisition device that stores at least two voltage values in memory, each from a different source, and determines if they are a match. Simple indicators, a non-limiting example of which is a bi-colored red/green LED 338, is used to indicate whether or not there is a valid voltage match between ~~335'As~~ 335A's battery voltage and that of a power supply featuring a manually-adjustable selector 337. Only power supply devices that create a valid green LED indicator when attached to module 357 can be safely attached to a powered device's battery interface.

Page 24, lines 21-31

Should power box 400 not have the requisite hardware for modulating a signal on a powerline, resistor array 509 is used as a simple means to communicate the requisite voltage change. MCU 102 (and software 101 (Fig. 1) in power source 100 (Fig. 2) uses its A/D converter functions to determine whether or not a power box 400 is requesting a voltage change at its power supply 122. Software 101 describes monitoring both powerline voltage and current. In particular, software 101 is looking for changes to the line load which indicate that MCU 102A in power box 400 has activated resistor array 509 (Fig. 13A). The resistive values that resistor array 509 are capable of creating on powerlines 505 and 507 are pre-determined, and are thus known to both software 800 and 101. When software 101 detects one of the pre-determined resistive values when checking line load, this serves as a signal ~~form~~ for power box 400 to reconfigure the Vout of power supply 122 from 5 VDC to 28 VDC.

Page 27, lines 16-24

A "smart" battery can communicate its design voltage value as a digital value to a data-enabled intermediate module 357 in Fig. 11. Battery-housing-shaped module 347 in Fig. 10 contains electronics equivalent to that shown in Fig. 13A (no power converter 122A in Fig. 13A is present, since the power converter is in power adapter 335 of Fig. 10). Modules 357 (Fig. 11) or 347 (Fig. 10) "translates" a voltage value, using software 101 or software 800 (Figs. 1 and 1A), to a data signal compliant with Castleman's voltage-identifier system. Thus, software 101 and 800 (and related

hardware) enable Castleman's closed-loop system to access voltage values at the battery pack interface, instead of the limiting primary power port of a powered device. The software can also translate analog or digital voltage-specific information into readable data that is compliant with Castleman's schema.

Page 28, lines 15-22

Power adapter 335 in Figs. 10 and <u>335A in Fig.</u> 11 can be only a basic non-configurable AC/DC (or DC/DC) power converter. Although both figures indicate a manual voltage selector 337, in some modalities there may be no ability to communicate with, control, or otherwise configure a power adapter 335. However, module 347 can confirm the output voltage of power adapter 335, and allow power to pass through module 347 and into laptop 349, only if the input voltage at module 347 matches the power requirements of laptop 349. Thus, module 347 serves a vital safety function in protecting laptop 349 from external power adapters like 335 that can output a mis-matched voltage.

Page 28, lines 31-32 — Page 29, lines 1-10

As shown in Fig. 13, power adapter 335B has a data port 406. Data connector 406 is shown as a parallel port interface, but it can be a USB, serial or any other data I/O port. This port connector gives access for power-related data to software within laptop 349 in Fig. 10. Thus, voltage data acquired at a battery 355 (Fig. 11) by module 357 (or, in the alternative, at a battery-pack configured module 347 (Fig. 10)) is communicated over powerline 336 (using powerline modulation) to a data-enabled power adapter 335. Power adapter 335B (Fig. 13) has a data port 406 that connects to a powered device 349 (Fig. 10). Voltage data previously discussed as acquired from a battery module 347 in Fig. 10 (or external module 357 in Fig. 11) is communicated from module 335B, via data connector 406, to powered device 349. Software resident on powered device 349 captures voltage data from power adapter 335B and stores it in non-volatile memory (or writes it to a storage media such as a

hard drive). An external module 357 (Fig. 11) can also have a data I/O equivalent to a port 406 shown in Fig. ~~10~~ 13, and as 406A in Fig. 10.

Page 32, lines 2-13

In the evolving specifications, external devices such as power adapters, can potentially access battery and charger data. While no provisions currently exist for an external device to manipulate a powered device 349's charger control, a power adapter 335, 335A, or 335B (Figs. 10, 11, 13) (and schematically 400 in Fig. 13A) is capable of monitoring battery and charger activities. One means of controlling charging from an external device 335 is by disabling power to a powered device (assuming that an external adapter is delivering power to a device's primary power port 343 (Figs. 10 and 11), instead of utilizing the battery bypass shown in Figs. 6-6E). Although an aggressive approach, discontinuing external power delivery can be rendered a harmless event. An external device such as module 335A (Fig. 11) that can monitor a battery data bus to confirm that a battery pack 355 has sufficient remaining capacity to power its host device. This eliminates any risk of a possible hardware crash caused by lack of battery power when shutting down external power in order to prevent battery charging.[[.]]

Page 33, lines 4-14

Castleman can also access the battery port via a connector 290 in Fig. 8, for example, used in conjunction with a module 347 in Fig. 10. Module 347 is needed because Castleman addresses common data ports, and not ports that support SMBus (or Dallas 1-Wire) data protocols. Therefore, module 347 is needed to translate smart battery bus data to a format readable by Castleman's apparatus. Furthermore, since software 800 in Fig. 1A is already resident either on a powered device (and/or embedded in a powered adapter 335 or a module 347 as in Fig. 11), a Castleman-compliant cord with an embedded Dallas chip can be connected, and the chip can be written-to from a modified version of software 800. Thereafter, the

cord can be used according to Castleman's apparatus. The Dallas Semiconductor "I-Button" series of writeable data chips can be written-to using a 0.5-volt power signal at a parallel port, as a method of creating a Castleman-readable chip.

Page 34, lines 20-29

The processes defined in software 101 and 800, in Figs. 1 and 1A respectively, includes methods of acquiring battery pack voltage without the inclusion of a specific type of power supply. Fig. 11 shows an intermediate data acquisition module 357 to which a plurality of power supply types and battery packs can be connected. This module is not restricted to the form-factor of an in-line device. It can be expressed, as a non-limiting example, as a PC Card (previously PCMCIA card). It can be a module that communicates with a powered device by attaching to a data port, or that wirelessly sends voltage and other information from software 101 or 800 in Fig. 1 and 1A to a powered device. Thus, software 101 and 800 can operate without a power supply <u>as an interposed communications element</u>, *per se*, by using a module 357 to acquire data at a battery, then to convey it to a powered device through any available data port, so as to render such data accessible to software.

Page 53, lines 15-28

Assembly 250 in Fig. 7 has the advantage of being left permanently, or semi-permanently in place. A simple 4-pin connector can be fitted to the flex assembly 250 where wires 252, 254, 256 and 258 interface. This connector is designed to accommodate the previously-mentioned switching circuit. At such low power as indicated here, an attenuator n-signal switch, such as those available from Maxim Integrated Products (Sunnyvale, CA) can be used. It can be wired so that voltages from either cells 288 or from a power supply (not shown, but referenced as an embedded power supply 122 in Fig. 1, or an external power ~~supply~~ <u>converter</u> 122A in Fig. 13A) activate the switch positions.

Data Acquisition

An external power source (such as hardware assembly 100 in Fig. 2, or power box 400 in Fig. 13A) can read the actual voltage (both load and no-load) of battery cell(s) 182 (as in Fig. 6 and identified as battery pack 134 in Fig. 2). This information is acquired through the various I/O pins of an A/D converter ~~102B~~ 104A (see ~~Fig.~~ Figs. 2 and 2A), and either stored in memory ~~102A~~ 104B, or immediately used to compute a valid voltage value to which a configurable power supply 122's output can be set.

Page 64, lines 14-20

While not included in hardware, a battery tester/reconditioner can be included in an assembly 100 in Fig. 2. This is indicated in situations where a large number of mixed-type powered devices are attaching to a hardware assembly 100 (Fig. 2). As a non-limiting example, on a commercial aircraft, passengers may be connecting everything from cellular phones, laptops, rechargeable electric shavers, etc., to an embedded power assembly 100. Should battery charging be one of the functions prescribed for software 101 in ~~Fig. 1 and~~ Fig. 1 and related hardware, a battery tester and reconditioner screens many of the issues relating to Vmin and Vmax.

Page 91, lines 27-32

~~Figure~~ Fig. 1A illustrates software 800 that operates primarily with external power conversion adapter hardware, a non-limiting example of which is device 335B in Fig. 13 (and shown diagrammatically as 400 in Fig. 13A), or equivalent external power adapters. The hardware is comprised of manually-selectable output-voltage indicator 337, configurable DC/DC (or AC/DC) power ~~supply~~ converter 122A, blink/solid LED indicator 402, powerline switch 526, and a source of logic, controller and data acquisition, such as microcontroller (MCU) 102A.

Page 93, lines 1-4

Manual voltage selector 337 is not essential to the operation of configurable power adapter 335B in Fig. 13 (~~digramatically~~ diagrammatically device 400 in Fig. 13A).

MCU 102A is capable of automatically configuring power converter 122A without any user intervention. This would be a preferred mode for delivering a matched voltage to a powered device.

Page 93, lines 16-26

Fig. 11 shows a variant, with an intermediate power[[-]]_conversion box 357 that is inserted in-line between a manually configurable power adapter 335A and a host device 349's battery pack 355. This configuration of power-conversion box 357 is comprised of an MCU 102[[B]]A (Fig. 13A), an LED 338, and a powerline switch 562B 526A (reference 526 and 526A in Fig. 13A for equivalents). Power conversion box 357, having acquired at least one voltage from battery 355, then samples the output voltage of power adapter 335A while a user rotates selector 337A. Once the output voltage from power adapter 335A matches the desired voltage, the MCU in box 357 illuminates its LED as described above. Powerline switch 526B 526 or 526A is held closed by MCU 102[[B]]A as long as the output voltage from power adapter 335A matches the defined voltage. Should a user rotate selector 337A to a position that is not a match, even while power adapter 335A is in operation, software 800 commands MCU 102B to open powerline switch 526B 526 or 526A, which discontinues power to powered device 349.

Page 96, lines 11-24

If the detected input voltage is 5 VDC, software 800 is pre-programmed to execute all processes shown in Fig. 1A. A 5 VDC-detected input voltage is an indication to software 800 that it is connected to specific matching hardware. Such hardware as exemplified in assembly 100 Fig. 2, and its related software 101 in Fig. 1, are configured to perform interactions with hardware equivalent to 400 in Fig. 13A and software 800. As a non-limiting example of which is that MCU 102A in Fig. 13A performs functions, such as turning on LED 402, that alter the overall detectable load of hardware 400. Software 101 is configuring its power supply converter 122A to output a low voltage (in this non-limiting example, +5 VDC) from its power supply

converter 122A. Software 101, and related hardware 100 as exemplified in Fig. 2, is monitoring the load at input powerlines 114 and 166 (which are the same as powerlines 505 and 507 in Fig. 13A). When LED 402 in Fig. 13A turns on, software 101 detects that change in load (the value of which was predetermine at the time of manufacture of power box 400). Software 101 then changes its output voltage to 28 VDC. Software 800 in Fig. 1A, senses the change in input voltage from +5 VDC to 28 VDC, and switches on DC/DC power converter 122A in Fig. 13A, via control line(s) 510.

Page 126, lines 1-8

Line-voltage monitoring steps 921-913 in software 800 (Fig. 1A) are also used to determine a specific user activity, namely, disconnecting power by removing connector 132 from battery pack 508B (Fig. 13A). As soon as a 0-volt state is detected in step 938, MCU 102A and software 800 immediately issue a shut-down command to power converter 122A. Precursors of this disconnect state include changes in line load which are identified with an Ohm value previously identified as LL^6. Ohm value LL^6 corresponds to powered device 508C being turned OFF. If the answer to software test in step 945 is FALSE (NO), software 800 commands power supply converter 122A in Fig. 13A to shut down.

REMARKS

The Examiner is advised that a petition for a three month extension of time is enclosed, together with fee based on small entity.

Also find attached Applicant's Supplement To Interview Summary, and three attachments thereto as indicated in the list of enclosures below.

Please acknowledge receipt hereof by stamping and returning the enclosed return postcard.

Applicant is available by phone at (818) 340-7268, or fax at (818) 883-5706.

Enclosed:
    "Exhibit A" (2 sheets)
    Applicant's Supplement To Interview Summary, mailed 9 June 2004
        Office Action, mailed 21 February 2003
        Applicant's Response to the Office Action, mailed 21 August 2003
        Informal Amendment for Purposes of Interview, faxed 25 November 2003
    Revocation of Power of Attorney, copy (3 sheets)
    Transmittal Form
    Fee Transmittal
    Petition for Extension of Time
    Check
    Return Postcard

Respectfully submitted,

Patrick Potega
Applicant, Pro Se

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"Exhibit A"

Table A

Office Action Cited Prior Art Reference	Office Action Cited Applicant's Claim Reference	Takahashi's Embodiment
Fig. 39	"A method and a computer readable medium for supplying power to a powered device, comprising:	**Ninth Embodiment**
"In the arrangement shown in FIG. 6, as in the case of the battery 10, a battery 30 consists of a series circuit formed by an ideal battery portion having an open-circuit voltage E0 and an internal resistor having a resistance r0. A resistor 32 is a load resistor having a resistance Rl, and an ammeter 34 measures a current I flowing through the load resistor 32. An AC signal generating circuit 36 generates an AC signal having a predetermined amplitude." (Col. 8, lines 35-39)	"preloading said battery with a resistive load,"	**Second Embodiment** "FIG. 6 is a block diagram showing the arrangement of a second embodiment of the remaining-amount-of-battery detecting device according to the present invention." (Col. 8, lines 31-33)
"In FIG. 12, a battery to be measured is designated by reference numeral 130. A load circuit 132 has a resistance which varies with the operating state thereof. A measuring circuit 134 measures an interterminal voltage V of the battery 130 and a current I flowing through the load circuit 132." (Col. 12, lines 1-6)	"varying said resistive load on said battery,"	**Fourth Embodiment** "FIG. 12 is a block diagram showing the arrangement of a fourth embodiment of the remaining-amount-of-battery detecting device according to the present invention, in which a battery is connected to a load whose resistance varies with the operating state thereof." (Col 11, lines 63-67)
"An A/D converter 48 digitizes an interterminal voltage V of the battery 30 (the output from the low-pass filter 44), a voltage drop vo across the load resistor 32 and the battery 30 in an AC signal (the amplitude of an AC signal supplied from the capacitor 46). . . ."(Col. 8, lines 46-50)	"detecting the extent of voltage sag upon preloading said battery," Office Action commentary: "(i.e., An A/D converter digitizes a voltage drop Vo across the load resistor 32 and the battery 30)"	**Second Embodiment** "An arithmetic circuit 50 consists of a microcomputer for calculating the remaining service time of the battery 30 from the data outputted from the A/D converter 48. A display 52 displays the remaining service time of the battery 30 calculated by the arithmetic circuit 50. A memory 54 is similar to the memory 26 shown in FIG. 2, and stores data on the discharge characteristic of the battery 30." (Col. 8, lines 54-61)
". . .and quantitatively detect the extent of charge or discharge of the battery 10" (Col. 7, lines 48-49)	"analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,"	**First Embodiment** "The method of converting the discharge characteristic of FIG. 4 into data may be, for example, to convert the

	remaining service time of a battery into an approximate function of an open-circuit voltage or to prepare the remaining service time of a battery relative to an open-circuit voltage in the form of table data and read, from the table, data indicative of the remaining service time of the battery corresponding to an obtained open-circuit voltage." (Col. 7, lines 48-57)
"An arithmetic circuit 50 consists of a microcomputer for calculating the remaining service time of the battery 30 from the data outputted from the A/D converter 48. A display 52 displays the remaining service time of the battery 30 calculated by the arithmetic circuit 50." (Col. 8, lines 54-59)	Office Action commentary: "(i.e., and quantitatively detect the extent of charge or discharge of battery 10)" **Second Embodiment** "'FIG. 6 is a block diagram showing the arrangement of a second embodiment of the remaining-amount-of-battery detecting device according to the present invention." (Col. 8, lines 31-33)
" . . .it is also possible to adopt an arrangement in which an AC adapter is connected in parallel to a secondary battery so that electrical power is supplied from the adapter to the camera unit or the VTR unit 632 while the battery is being charged." (Col. 27, lines 54-58)	"supplying the appropriate voltage to the powered device from said configurable power supply, instead of said battery." Office Action commentary: "(i.e., it is also possible to adopt an arrangement in which an AC adapter is used in parallel to a secondary battery so that the electrical power is supplied from the adapter while the battery is being charged)." **Ninth Embodiment** "According to the ninth embodiment, it is possible to estimate the remaining-amount value of battery power highly accurately even while the operating modes are being switched. It is also possible to correctly update the estimated remaining-amount value of battery power even if a video camera is continuously used without switching its operating mode. Further, even if a non-battery type power source is used, an inappropriate remaining-amount value is not displayed." (Col. 27, lines 59-67)

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Patrick H. Potega, Pro Se	) **RE: APPLICANT'S SUPPLEMENT**
	) **TO INTERVIEW SUMMARY**
	)
Serial No.: 09/475,945	) Date: 9 June 2004
	)
Filed: 31 December 1999	) Examiner: Zoila E. Cabrera
	)
For: "SOFTWARE FOR CONFIGURING	) Group Art Unit: 2125
AND DELIVERING POWER"	)

RECEIVED

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

JUN 1 7 2004

Technology Center 2100

ATTN: Zoila E. Cabrera, Examiner

Applicant's Supplement To Interview Summary

Sir:

This is in response to the Interview Summary Form received by applicant as attached with the Office Action mailed 9 December 2003.

This Supplement to the Interview Summary is being submitted with applicant's response to the Office Action mailed on 9 December 2003.

Pursuant to MPEP 713.04, applicant herewith presents the following supplemental information as relevant to the substance of the subject telephonic interviews that took place on November 21, 24, 25, and 26.

Phone Communication of 21 November 2003

In the phone interview of 21 November 2003, Examiner and applicant discussed applicant's response of 21 August 2003 to the Office Action mailed 21 February 2003. The Examiner informed applicant that, under 35 USC § 102(b), the two original independent claims 52 and 78 were still being rejected as anticipated in the prior art by Krall (US 5,621,299).

The principal arguments put forth by the Examiner were that:

- The language of applicant's claims 52 and 78 was too broad

- Because some elements and features of applicant's claimed invention were recited in the preamble of the subject claims, the Examiner was not giving full weight and significance to these elements in considering the reasoned arguments for overcoming the prior art objections applicant presented in his response to the Office Action. The Examiner further argued that those elements recited in the "body" of the claim are usually only considered as having sufficient significance to the Examiner in being relevant to the prior art

- That the term "adapted" in applicant's claims constituted a "weak word" when used in claim writing

- A further search for prior art by the Examiner may have found other inventions that read on applicant's claims, as they are currently written.

The Examiner proposed that applicant consider including other elements, such as a look-up table, to further narrow the subject claims. The Examiner also suggested that the claims be rewritten using another word than "adapt."

The Examiner requested that applicant fax her a "proposed amendment," which should include applicant's changes to claims 52 and 78, and any further reasoned arguments applicant might have to overcome the 102 objections regarding the Krall prior art. Both parties agreed that this proposed amendment would be the basis of a second phone interview.

The Examiner also indicated that she had only a few weeks before she would have to move this application to its next stage and, therefore, applicant's deadline for submitting the proposed amendment would be no later than 25 November 2003.

Phone Communication of 24 November 2003

In the phone interview of 24 November between the Examiner and applicant, applicant asked the Examiner why this new 112 objection (under 35 USC 1129b) as to the vagueness of claims 52 and 78 was not brought forth in the first Office Action of 21 February 2003, since the lack of any 112 objection in the first Office Action indicated to applicant a tacit acknowledgement that the claims were in good order and suitable for allowance. By raising this objection now, the prosecution process was being unduly extended and, further, the absence of such an objection to the claims being indefinite in the subject Office Action caused applicant to respond to the prior art objections of first Office Action from a perspective that was not based on full knowledge of all of the Examiner's concerns as to the actual condition of applicant's claims.

Given applicant's need to quickly respond in writing to the issues raised by the Examiner in the telephonic interview of 21 November, applicant asked the Examiner to please fully clarify the specifics of this new alleged 112 objection. Applicant indicated that, without such feedback from the Examiner, applicant's ability to present in the pending proposed

amendment that was due on 25 November any further reasoned arguments to overcome the prior art objections would be compromised.

The Examiner stated that she had already indicated, in the phone interview of 21 November, the basis for the new objection as to the subject claims being indefinite.

She suggested that applicant incorporate all of the elements of dependent claims 79, 93, and 103 as a possible way of overcoming the 112 objections, and also as a possible approach to overcome the prior art anticipating those claims. Applicant stated that, because the Examiner's suggested claims 79, 93, and 103 recite some five (5) pages of very narrow elements of applicant's claimed invention, that incorporating these extensive elements into independent claims 52 and 78 would result in such narrow claims so as to render them useless against any future potential infringers.

The Examiner and applicant then discussed the 103 objections regarding applicant's claims reading on Krall's prior art. Applicant presented a line by line reading of the specific references to Krall cited by the Examiner on page 4 of the 21 February 2003 Office Action. Applicant asked the Examiner to please cooperate by going to the prior art to further references cited in the Office Action, so that they could both see the full context and scope of each of the references cited, but the Examiner was not inclined to do so.

Applicant argued that each individual cited reference from Krall had wording that superficially [pointed to] elements in applicant's subject claims -- for example, Krall's invention teaches about batteries, and applicant's claim recites a battery -- but that such superficial uses of such terms does not constitute valid bases for a 103 objection. Applicant illustrated this by pointing out to the Examiner that Krall's specification talks about two batteries, and that the cited references in the Office action rely on one of the batteries (Krall's elements 11-13 in Fig. 1) as reading on applicant's claims, then

elsewhere in the Office Action relies on a reference to the other of Krall's two batteries (Krall's element 109 in Fig. 7). Applicant argued that by the Office action juxtaposing these references to two quite different batteries, the resulting interpretation of Krall was strained. The Examiner seemed to be in agreement with applicant on this point.

Applicant further argued that the references to Krall's Fig. 7 cited in the Office Action does not substantiate even any similarity to -- yet alone an anticipation of -- applicant's claim language about "preloading a battery for detecting a voltage sag." Applicant specifically pointed out that, not only does the Office Action's reference to Krall preloading a battery not have any support anywhere in Krall's specification of any mention whatsoever of the prior art's battery 109, but that Krall specifically teaches just the opposite. Applicant pointed out the reference in Krall which teaches that "substantially no current need be drawn for the purpose of making the voltage measurement. . . ." Applicant stated, and the Examiner seemed to respond receptively, that anyone skilled in the art would know that applying a load to a battery, as recited in applicant's claims, would result in drawing current from that battery. Thus, unlike applicant's reciting of applying a load to a battery (Krall's battery 109 in Fig 7, of the two batteries in the prior art, being the battery that most resembles applicant's claimed battery), Krall here clearly and unambiguously teaches away from applicant's claims.

Applicant again pointed out to the Examiner, as more of the line item objections stated in the Office Action were brought forth in the conversation, that the linking together of disparate and often unrelated references from Krall's specification and Figures did not, in the aggregate, constitute a valid operational invention. Instead, a reference that only suggests by taking it out of context that the prior art applies a load a battery for charging Krall's battery 11-13 (applicant's claimed invention specifically prevents battery charging), to which another reference is added that only suggests varying the load, etc., does not result in a series of references related to each other in the specification that *in toto*, results in Krall's invention. Applicant commented that there are references to apples

and references to oranges in Krall which the Examiner is juxtaposing and stringing together under the pretext of defining an alleged invention that anticipated applicant's claims. Applicant again asked the Examiner's assistance in helping him understand how the Examiner interpreted each of the cited references, so that applicant could better respond. The Examiner did not offer anything further.

Applicant then presented another reasoned argument to the Examiner. Applicant indicated that claims 52 and 78 recite a "device adapted for selectably receiving power from a battery and a configurable power supply." Applicant argued that Krall nowhere teaches that his device which receives power is in any way at all adapted in order to do so. Instead, Krall's external power system is adaptable, so that either the prior art's battery or his external power supply can be selected as a source for delivering power to a "non-adapted" device. The Examiner did not accept this argument, and insisted that the subject claims were too broad and, thus, can be read as anticipated by Krall.

The Examiner suggested that applicant incorporate the structure of a connector interface into the subject claims, thereby narrowing the claims and putting them into a potentially better condition for allowance. Applicant agreed to consider this.

Further, the Examiner indicated that she had already been conducting further searches for other prior art, and had found something relevant, and that she was inclined to do even further searches and then to make the next (second) Office Action final. Applicant responded that he was making every reasonable effort to move the prosecution of the application forward, and that he would be willing to rewrite the claims if necessary, but that without some inputs from the Examiner as to the specific concerns or issues that applicant needs to address, that to simply continuing to suggest incorporating apparently arbitrary elements, such as a connector interface, a look-up table, etc., to the subject claims was not appropriate.

Applicant asked the Examiner about the word "adapted" in the subject claims. Specifically, applicant indicated that the meaning he ascribed to that word was related to something being "changed" or "modified." The Examiner responded that she was allowed to interpret the words in any claim as she saw fit, and that she still reads applicant's claims in a way that clearly indicates they were anticipated by Krall. Applicant suggested that perhaps the dictionary definition of "adapt" and the synonyms or related terms might help both the Examiner and him find a mutually acceptable solution to this issue. As to how finding a term to replace "adapted" in the subject claims would impact the fact that there was still no reference in Krall's specification or drawings that even suggest that he teaches any adapting of his powered device, applicant suggested that the Examiner identify at least one specific reference, so that both the Examiner and applicant could better understand how Krall used the term (or some equivalent). Applicant proposed that this information would help save the Examiner time, since applicant would be willing to take a different approach in redrafting the subject claims if Krall did indeed use any term that even suggested an "adapting" of a powered device. The Examiner responded in the negative to applicant's suggestion.

The Examiner further stated that perhaps applicant should be thinking about potential future appeals and petitions.

Applicant reasserted that he would uphold his part of the bargain and would be faxing some variants of the existing claims, and any further reasoned arguments relevant to the prior art, by the agreed deadline of 25 November. Applicant added that he would pay particular attention to the issues of the expressions or elements in the preamble of the claims having less weight than those in the body of the claim, and also that applicant would make a good faith effort to present an equitable resolution to the issue of the word "adapted."

Phone Communication of 25 November 2003

On 25 November, 2003, prior to faxing the agreed upon "Informal Amendment For Purposes of Interview" to the Examiner, applicant contacted the PTO's Inventors' Assistance Center. Applicant asked about how specific disputed words in claims are resolved. Applicant was told that sometimes a simple copy of a page from an authoritative dictionary is all that is needed. Applicant did supply in his faxed Informal Amendment pages from an on-line dictionary.

Applicant further inquired about there possibly being in the PTO some sort of list of vague or unsuitable words. The technician searched the MPEP and other documents for some considerable time while applicant was on the phone, but could not locate anything specific as to words that should be avoided in claim writing.

Prior to faxing the Informal Amendment, applicant called to let the Examiner know that the anticipated document would be submitted later that day, and that applicant was looking forward to the phone interview. As the Examiner was available, applicant briefly spoke with the Examiner. The Examiner stated that her interpretation of the word "adapted" meant "able to be" powered. Applicant proposed several alternative words, but they were not acceptable to the Examiner. The Examiner again brought up the issue of vagueness in the applicant's claims language.

Applicant again requested of the Examiner that she provide a specific citation from the prior art's Description that teaches an "adapting," "modifying," "altering," etc., of Krall's powered device. She said that she would not.

Applicant spoke briefly with Mr. Leo Picard, Supervisory Patent Examiner, Technology Center 2100, and generally expressed applicant's concerns about the Examiner's unwillingness to bring forth any information whatsoever that would result in a resolution

of the disputed claims and the matter of the prior art. Applicant stated that he had, in the past, encountered only positive and very helpful Examiners, so he was not comfortable with the current Examiner's seeming resistance to move this prosecution forward. Mr. Picard said that he would speak with the Examiner.

First Phone Communication of 26 November 2003

Applicant called the Examiner to verify receipt of the previous day's faxed "Informal Amendment For Purposes of Interview." The Examiner acknowledged that she had received my submittal, but hat she was working on something else that day. Applicant reminded the Examiner that she had originally solicited the subject document from applicant, because she had a deadline.

The Examiner stated that she saw nothing in the informally-submitted proposed claims that wouldn't result in her doing further searches for other prior art before writing her official action. Applicant reminded the Examine that the agreement was that the faxed matter was to be the basis for an interview by phone, and that the Examiner and applicant were supposed to discuss ways to possibly amend the claims. The Examiner stated that it would be best if she just sent me her findings in writing, and that we shouldn't discuss anything further, adding "Let's do this all on the record." Applicant stated that he was becoming concerned about this apparent change in the Examiner's position in resolving these matters, and further told the Examiner that he couldn't improve the claims without inputs from the Examiner.

Applicant asked the Examiner if any of the eight (8) proposed claims might overcome the Examiner's objections. The Examiner responded to the effect that: "I don't know. I'll have to do a further search. Now that you have changed the claims, I'll have to do a further

search." The Examiner added that the claims were still to broad but, when asked by applicant for more specifics, she would not elaborate.

Applicant said he had a number of concerns and was becoming personally uncomfortable with the situation, because:

1. Applicant expressed his concern that the original understanding as to why applicant was asked to submit the Informal Amendment was to discuss informally proposed new claims that might overcome the Examiner's 35 USC § 112 and § 102 objections. Now, it appeared that the Examiner was not holding up her end of the bargain.

2. Applicant further stated that, even though he had formally in the Informal Amendment requested that the Examiner write acceptable claims under MPEP 707.07(j) because the current claims were being considered as technically inadequate, that the Examiner -- by refusing to do so -- was apparently not making a reasonable effort to move the prosecution of this application forward.

3. That the Examiner continues to not respond to applicant's detailed questions as to the specifics of how the subject claims anticipate the prior art.

4. Applicant expressed his concerns that he felt intimidated by Examiner's repeated statements and remarks in every conversation about having to do further searches for other prior art, even though there was no basis for further searches, except to threaten or intimidate the applicant.

5. That applicant felt it unfair of the Examiner to not raise the USC 35 § 112 objections to the subject claims in the first Office Action. Applicant could not understand why the Examiner's first reading of the claims in question did not

bring to light their vagueness and indefiniteness, so that only now, after having responded to a first Office Action, was Applicant being confronted with this issue of the claims being overly broad. Applicant pointed out that he responded to the first Office Action with some 65 pages, mostly being arguments against the cited prior art, only to now find that the prior art search was potentially flawed by the overriding issue of overly broad claims. Had applicant had an opportunity to rewrite the claims to overcome a known 112 rejection, the resulting narrowed claims may not have read on Krall at all.

The Examiner indicated that she did not want to continue the conversation, and that she had spoken with Supervisor Picard the day before. She proffered a three-way conference call which would include Mr. Picard. Applicant agreed, but indicated that he would still like to have the benefit of the promised phone interview with the Examiner, so that he would be better prepared for the conference call. The Examiner closed by saying that she would "Do something next week."

Second Phone Communication of 26 November 2003

Supervisor Leo Picard and the Examiner met with applicant on a conference call later on the same day as applicant's previous phone communication (above) with the Examiner.

The Supervisor mostly spoke during this phone communication, and the Examiner said almost nothing. The Supervisor was quite direct, and perhaps what might be construed as somewhat aggressive. This came out primarily in this remarks to applicant such as "Go get an attorney, that's what they're for" when applicant had said that he was expecting the Examiner to uphold her end of the bargain and participate in a constructive interview. Applicant replied to the Supervisor that an attorney in a major patent law firm had drafted the subject claims. When applicant asked about the lack of feedback from the Examiner

as to unresolved issues with the prior art, applicant was told "Pro Ses don't understand these things." Applicant indicated that he held three US Patents, and several pending applications.

The Supervisor agreed that the claims were vague, and that he didn't like any of my proposed claim amendments. Applicant said that, because the issue went to the technical matter of the claims, that he had requested the Examiner write some claims. The Supervisor was quite curt in his response, saying that "Our job is not to help write claims."

When applicant asked about the agreed to interview and the submitted "Informal Amendment For Purposes of Interview" document, the Supervisor stated that he was not going to make the claims submitted "on the record," but that the ten (10) pages of further arguments overcoming Krall's prior art would be of the record.

The conversation turned to the prior art, and the Supervisor cited a passage from Krall to make a point. As it happened, the sentence following the cited passage in Krall's description was the very one that applicant had repeatedly pointed out to the Examiner as conclusively proving that the prior art did not teach applicant's "preloading a battery." The Supervisor responded to my argument by acknowledging that applicant's cited reference seemed significant, and he brought the citation to the Examiner's attention and specifically asked the Examiner if she agreed or disagreed that the quote from Krall's description proved applicant's point. The Supervisor and the Examiner spoke together for a minute, but applicant could not discern what was being said. The Supervisor returned to the phone and said that applicant should be sure to include the specific reference in Krall in the next response to an Office Action, and the Examiner then pointed out that applicant had already provided this in the "Informal Amendment For Purposes of Interview." The Supervisor then stated that the Examiner would consider applicant's argument.

Applicant further pointed out to the Supervisor that the references cited by the Examiner in alleging that Krall anticipated applicant's claimed invention included incompatible and inconsistent references to two different batteries in the prior art, and that the examiner was relying on a misunderstood reference. The Supervisor made no comment on this point.

The phone conversation closed with a discussion of the term "adapted" in applicant's claims. Applicant brought to the Supervisor's attention the pages from on-line dictionaries that applicant had provided as part of the Informal Amendment. Applicant made the point that the Examiner kept insisting that applicant's claims were broad, but not vague, yet the word adapted seemed to be suspect in the Examiner's view because it caused a claim to be more vague than broad, and that the Examiner interpreted the term "adapted" to mean "able to be" [something]. The Supervisor responded that applicant's claims were vague, and that applicant should hire an attorney: "After all, that's why attorneys make the big bucks!" Applicant reminded him that a major law firm, Loeb & Loeb, had drafted the subject claims, thereby now putting applicant -- now Pro Se -- in this position.

Applicant can be contacted at (818) 340-7268, or by fax (818) 883-5706.

Respectfully submitted,

Patrick H. Potega
Applicant, Pro Se
7021 Vicky Avenue
West Hills, CA 91307-2314

Tel: (818) 340-7268
Fax: (818) 883-5706

Enclosures:

Office Action mailed 21 February 2003

Applicant's response to the Office Action mailed 21 August 2003

Applicant's Informal Amendment For Purposes of Interview, faxed on 25 November
2003

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail #EU662600845US in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

9 JUNE 2004

(Date of Deposit)

Patrick H. Potega

(Name of Applicant, Assignee or Registered Representative)

(Signature)

9 JUNE 2004

(Date)

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/475,945	12/31/1999	PATRICK H. POTEGA	1092-106.US	7098

7590   02/21/2003

Patrick H Potega
7021 Vicky Avenue
West Hills, CA   91307-2314

JUN 0 9 2004

EXAMINER
CABRERA, ZOILA E

ART UNIT	PAPER NUMBER
2125	

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Application No.	Applicant(s)
Office Action Summary	09/475,945	POTEGA, PATRICK H.
	Examiner	Art Unit	
	Zoila E. Cabrera	2125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *20 November 2002* .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-78* is/are pending in the application.

     4a) Of the above claim(s) *1-51 and 53-77* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *52 and 78* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☒ Claim(s) *1-78* are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

     If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All b) ☐ Some * c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

     a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1.   Newly submitted independent claims 21, 34, 39, 53, 63 and 69 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 21 and 53 are directed *to determining an anticipated fully charged or nearly discharged battery* wherein a look-up table comprising a substantial matrix of battery design parameters expressed as voltage values of a multiplicity of batteries arranged by both chemistry type and typical cells-per-park configurations is used. Claims 34 and 63 are directed *to determining the chemistry-type of a battery* wherein a LIST function and SORT function is used. Claims 39 and 69 are directed to *an apparatus and method for employing electrical load values in determining various machine states of a user-interactive apparatus for delivering power to a battery-powered device* wherein a first, second and up to seventeenth machine states are disclosed.

Since applicant elected claims readable on the elected invention of Group III, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 21-51, 53-77 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. The following are rules § 821, 821.03 as stated in the MPEP:

§ 821   **Treatment of Claims Held To Be Drawn to Nonelected Inventions**

Claims held to be drawn to nonelected inventions, including claims to nonelected species, are treated as indicated in MPEP § 821.01 through § 821.03.

The propriety of a requirement to restrict, if traversed, is reviewable by petition under 37

CFR 1.144 . In re Hengehold, 440 F.2d 1395, 169 USPQ 473 (CCPA 1971).

All claims that the examiner holds as not being directed to the elected subject

matter are withdrawn from further consideration by the examiner in accordance

with 37 CFR 1.142(b). See MPEP § 809.02(c) and § 821.01 through § 821.03. The

examiner should clearly set forth in the Office action the reasons why the claims

withdrawn from consideration are not readable on the elected invention. Applicant may

traverse the requirement pursuant to 37 CFR 1.143. If a final requirement for restriction

is made by the examiner, applicant may file a petition under 37 CFR 1.144 for review of

the restriction requirement.

821.03   Claims for Different Invention Added After an Office Action

Claims added by amendment following action by the examiner, MPEP § 818.01, §

818.02(a), to an invention other than previously claimed, should be treated as indicated

by 37 CFR 1.145.

37 CFR 1.145. Subsequent presentation of claims for different invention.

If, after an office action on an application, the applicant presents claims directed to an

invention distinct from and independent of the invention previously claimed, the

applicant will be required to restrict the claims to the invention previously claimed if the

amendment is entered, subject to reconsideration and review as provided in § § 1.143

and 1.144.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 52 and 78 are rejected under 35 U.S.C. 102(b) as being anticipated by

Krall (US 5,621,299).

Krall discloses a method and a computer readable medium for supplying power

to a powered device which is adapted to receive power selectably from a battery and a

configurable power supply, comprising:

preloading said battery with a resistive load (Fig. 1, element 23);

varying said resistive load on said battery (Fig. 1, elements 43, 23; Col. 6, lines

18-22);

detecting the extent of voltage sag upon preloading said battery (Col. 6, lines 56-

62; Col. 6, lines 18-22);

analyzing said detected voltage sag and determining the anticipated fully

charged battery voltage (Col. 7, lines 22-26, i.e., the maximum sustainable

current capacity of the batteries themselves);

supplying the appropriate voltage to the powered device from said configurable

power supply, instead of from said battery (Col. 7, lines 40-52).
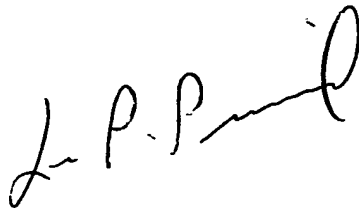
Conclusion

3.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning communication or earlier communication from the examiner should be directed to Zoila Cabrera, whose telephone number is (703) 306-4768. The examiner can normally be reached on M-F from 8:00 a.m. to 5:30 p.m. EST (every other Friday).

If attempts to reach the examiner by phone fail, the examiner's supervisor, Leo Picard, can be reached on (703) 308-0538. Additionally, the fax phones for Art Unit 2125 are (703) 308-6306 or 308-6296. Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist at (703) 305-9600.

Zoila Cabrera
Patent Examiner
2/14/03

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

		Notice of References Cited	**Application/Control No.** 09/475,945	**Applicant(s)/Patent Under Reexamination** POTEGA, PATRICK H.	
			Examiner Zoila E. Cabrera	**Art Unit** 2125	**Page 1 of 1**

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,254,937	10-1993	Mizoguchi, Shigeru	323/283
	B	US-5,621,299	04-1997	Krall, David A.	320/103
	C	US-5,751,134	05-1998	Hoerner et al.	320/124
	D	US-6,054,846	04-2000	Castleman, Neal J.	323/283
	E	US-6,081,077	06-2000	Canova et al.	315/307
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Patrick H. Potega, Pro Se) RE: RESPONSE TO OFFICE ACTION
)
Serial No.: 09/475,945) Date: 21 August 2003
)
Filed: December 31, 1999) Examiner: Zoila E. Cabrera
)
For: "SOFTWARE FOR CONFIGURING) Group Art Unit: 2125
AND DELIVERING POWER")

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTN: Zoila E. Cabrera, Examiner
Art Unit 2125

Response to Office Action

Sir:

This is in response to the Office Action mailed 21 February 2003.

Applicant requests that the subject application be amended as follows:

IN THE CLAIMS

Applicant acknowledges that, in the instant Office Action, the Examiner has withdrawn of claims 1-51 and 53-77 from consideration.

Applicant herein submits new Claims 79-108 as dependent claims readable on the previously elected invention of Group III. In the following claims, applicant has not renumbered original indpendent Claims 52 and 78.

The claims submitted herein contain 2 (two) original independent claims and 30 (thirty) new dependent claims. A fee for 30 (thirty) dependent claims is enclosed.

The new claims herein submitted contain no new matter, and fall completely within the scope of the material set out in the originally filed documents.

I claim:

1-51   (withdrawn)

52. (original):
A computer readable medium embodying program instructions for supplying power to a powered device which is adapted to receive power selectably from a battery and a configurable power supply, comprising:

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

53-77   (withdrawn)

79. (new):

The configurable power supply of claim 52, further including:

a processor for performing said program instructions embodied in said computer readable medium, the processor also being for performing control functions;

a processor-controlled analog-to-digital converter interconnected to said battery via an interface comprised of at least one of one or more input/output ports accessible to a plurality of conductors and contacts of a connector assembly, said interface being so configured as to provide a means of controllably electrically coupling at least one of one or more of said resistive loads on the battery for outputting to the analog-to-digital converter at least one minimum battery voltage, instead of a previous outputting of at least one maximum battery voltage;

a memory accessible to the processor for storing voltage values acquired by the analog-to-digital converter;

The computer readable medium further including a look-up table, also stored in the memory, comprising a substantial matrix of battery design parameters expressed as voltage values of a multiplicity of batteries arranged by both chemistry type and typical cells-per-pack configurations;

said computer-readable medium also further including program instructions for configuring said processor to perform a first comparing of the acquired maximum voltage value to each maximum design voltage value from said look-up table, and

to perform a second comparing of the acquired minimum voltage value to each

minimum design voltage value from said look-up table,

whereby said first comparing results in said acquired maximum voltage value being

excessively elevated as compared to said maximum design voltage values from said

look-up table, thereby determining said anticipated fully-charged battery, and

whereby said second comparing results in said acquired minimum voltage value being

excessively depressed when as compared to said minimum design voltage values from

said look-up table, thereby determining an anticipated nearly-discharged battery.

80. (new):

The determining of an anticipated fully-charged battery or a nearly-discharged

battery of claim 79, wherein said determining is performed prior to the execution of

further program instructions for configuring said processor to output a first voltage

value to said configurable power supply.

81. (new):

The look-up table of claim 79, wherein all indicated values are recalibrated to

compensate for an additional load of a means for controlling the direction of

electrical flow that is located so as to be electrically coupled to conductors of a

receptacle of said connector assembly so as to provide said configurable power

supply access to both said battery and a powered-device, said receptacle interface

being located along a housing of said battery.

82. (new):

The connector assembly of claim 79, further including a electively user-positionable

connector plug which, in a first position, transfers electrical signals between the

configurable power supply and said battery, instead of being in a second position

for transferring signals between said configurable power supply and a battery-

powered device.

83. (new):

    The selectively user-positionable connector plug of claim 82, further including program instructions for configuring an accessible processor to generate at least one of one or more visual indicia to a user, thereby prompting said user to manipulate said connector plug so that its contacts now transfer signals between said configurable power supply and said battery-powered device.

84. (new):

    The transfer of electrical signals between said configurable power supply and said battery-powered device of claim 82, further including in both said configurable power supply and said battery-powered device a means of inter-device communications for transferring signals.

85. (new):

    The means of inter-device communications of claim 84, further including additional program instructions for configuring processors at said configurable power supply and at said battery-powered device respectively to transfer data signals by at least one communications medium selected from the group consisting of powerline modulation, and wireless infrared, and serial/parallel data protocols.

86. (new):

    The acquired minimum and maximum battery voltage values of claim 79, wherein said values are retained in memory for use in further program instructions to configure said processor for calculating a voltage that represents at least a first output value of said configurable power supply.

87. (new):

The configurable power supply of claim 79, wherein said power supply is

embedded into aircraft systems.

88. (new):

The configurable power supply of claim 79, wherein said power supply is

incorporated into a discrete modular apparatus for interconnecting in-line between

an existing external power-conversion adapter and said connector assembly.

89. (new):

The computer readable medium of claim 52, wherein said computer readable

medium is embedded, and said program instructions are written to operate in an

embedded environment.

90. (new):

The computer readable medium of claim 52, wherein said computer readable

medium is incorporated into a battery pack, instead of a configurable power supply.

91. (new):

The computer readable medium of claim 79, wherein said program instructions

configure said processor to acquire said maximum battery voltage value prior to

acquiring said minimum battery voltage value, in order to take advantage of a

known recovery capability of said battery.

92. (new):

The computer readable medium of claim 79, further embodying program

instructions for configuring the processor to control a switch located in a circuit

between said analog-to-digital converter and said battery, for selectively electrically

coupling into the circuit at least one of one or more resistive elements.

93. (new):

The configurable power supply of claim 52, further including:

a general-purpose processor capable of accessing an analog-to-digital converter for acquiring voltage values of said battery;

a means of interconnecting said battery to an A/D converter including a receptacle at said battery for mating to a connector plug;

a memory to which said processor writes:

an acquired first value expressing a maximum output-voltage of said battery in a no-load condition;

a second value being retrieved from a look-up table comprising a substantial matrix of predetermined battery design parameters expressed as both maximum- and minimum-voltage reference values for a multiplicity of battery cells-per-pack configurations arranged by chemistry types;

said computer readable medium further embodying program instructions for configuring said processor for performing a comparing of the acquired first value to the retrieved second value as a maximum-voltage reference value, and

said processor analyzes the results of said comparing by determining whether said acquired first value is within a predetermined tolerance range of voltage variance when compared to the retrieved maximum-voltage reference value, whereby said analyzing resulting in either:

accepting said comparing as confirming that both voltage values are substantially the same, whereupon said processor writes both values to memory, or

rejecting said comparing because said acquired first value falls outside said predetermined tolerance range of voltage variance when compared to said retrieved maximum-voltage reference value, whereupon said processor discards the rejected maximum-voltage reference value and then retrieves from among the previously unselected maximum-voltage values in said look-

up table another reference value for repeating said comparing and analyzing functions;

said retrieving, comparing and analyzing functions repeat until said analyzing results in an accepting of both the acquired first and retrieved maximum-voltage reference values, whereupon said processor writes both values to memory;

a means of electrically engaging at least one of one or more resistive elements as a predetermined electrical pre-load temporarily applied to said battery for said analog-to-digital converter acquiring from said battery a third value expressed as a minimum output-voltage, said processor then writing said acquired third value to memory;

further program instructions for configuring said processor for retrieving from said look-up table a fourth value expressing a predetermined minimum design voltage of a battery of the same cells-per-pack configuration and chemistry type as that of the previously accepted maximum-voltage reference value, said processor then writing the retrieved value to memory as a minimum-voltage reference value;

additional program instructions for configuring said processor for performing a comparing of the acquired third value to the retrieved minimum-voltage reference value;

further program instructions for configuring said processor for analyzing the results of said comparing by determining whether said acquired third value is within a predetermined tolerance range of voltage variance when compared to said retrieved minimum-voltage reference value, thereby said analyzing resulting in either:

accepting said comparing as confirming that both values are substantially the same, whereupon said processor writes both values to memory, or

rejecting said comparing because said acquired third value falls outside said predetermined tolerance range of voltage variance when compared to said retrieved minimum-voltage reference value, whereupon said processor retrieves from among the previously unselected minimum-voltage reference

values in said look-up table another reference value for repeating said comparing and analyzing functions;

said retrieving, comparing and analyzing operations repeat until said analyzing results in an accepting of both the acquired third and retrieved maximum-voltage reference values, whereupon said processor writes both values to memory;

configuring said processor by further program instructions for executing a LIST function comprised of a compiling of the four previously accepted voltage values stored in memory, and

configuring said processor by additional program instructions for performing a SORT function upon the listed values by arranging the four previously accepted voltage values in ascending order,

whereby resulting in only a correctly determined battery chemistry type from among those in said look-up table yielding sorted values listed in a specific sequential order consisting of:

first, the retrieved minimum-voltage reference value;
second, the acquired minimum battery voltage value;
third, the acquired maximum battery voltage value, and
fourth, the maximum-voltage reference value.

94. (new):
The look-up table of claim 93, further including a charge rate for each battery chemistry type as a variable in a processor calculation to determine an impedance value of said at least om of one or more resistive elements.

95. (new):
The performing of a SORT function upon the listed values of claim 93, wherein an acquired maximum-voltage value that varies significantly from said predetermined battery design parameter because said battery being fully charged causes it to

output an excessively elevated maximum voltage, whereupon said acquired maximum-voltage value is adjusted by the predetermined tolerance range of voltage variance being calculated into said maximum-voltage value prior to said sorting.

96. (new):

The performing of a SORT function upon the listed values of claim 93, wherein an acquired minimum-voltage value that varies significantly from said predetermined battery design parameter because said battery being nearly discharged causes it to output an excessively low minimum voltage, whereupon said acquired minimum-voltage value is adjusted by the predetermined tolerance range of voltage variance being calculated into said minimum-voltage value prior to said sorting.

78. (original):

A method for determining the power requirements of a powered device adapted to receive power selectably from a battery and a configurable power supply, comprising:

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

97. (new):

The method of claim 78, further including a method of determining an anticipated fully charged or nearly discharged battery, comprising:

providing an apparatus for performing program instructions, comprising:

providing a processor capable of performing control functions;

providing a processor-controlled analog-to-digital converter interconnected to said battery via an interface comprised of at least one of one or more input/output ports accessible to a plurality of conductors and contacts of a connector assembly, said interface being so configured as to provide a means of controllably electrically coupling at least one of one or more resistive elements as a temporary electrical preloading of said battery for outputting to said analog-to-digital converter at least one minimum battery voltage, instead of a previous outputting of at least one maximum battery voltage;

providing a memory accessible to said processor for storing voltage values acquired by said analog-to-digital converter;

providing a computer-readable medium including a look-up table, also stored in said memory, comprising a substantial matrix of battery design parameters expressed as voltage values of a multiplicity of batteries arranged by both chemistry type and typical cells-per-pack configurations;

said computer-readable medium further including program instructions for configuring said processor to perform a first comparing of the acquired maximum voltage value to each maximum design voltage value from said look-up table, and

further including program instructions for configuring said processor to perform a second comparing of the acquired minimum voltage value to each minimum design voltage value from said look-up table,

whereby said first comparing results in said acquired maximum voltage value being excessively elevated as compared to said maximum design voltage values from said look-up table, thereby determining said anticipated fully-charged battery, and

whereby said second comparing results in said acquired minimum voltage value being excessively depressed when as compared to said minimum design voltage values from said look-up table, thereby determining said anticipated nearly-discharged battery.

98. (new):

The method of determing an anticipated fully charged battery or nearly discharged battery of claim 97, wherein excessively elevated or excessively depressed voltage values are compensated for by additional program instructions for configuring said processor for adjusting the excessive voltage values downward or upward respectively by a predetermined voltage tolerance amount, resulting in adjusted maximum- or minimum-voltage values that are available for other program instructions.

99. (new):

The preloading of claim 78, wherein at least one of one or more resistive elements is a power resistor having an impedance value substantial enough to simulate an operational load of said powered device.

100. (new):

The temporary electrical preloading of claim 97, wherein the resistive value of at least one of said one or more resistive elements is determined by the charge rate of a battery based on its chemistry-type, as expressed in a look-up table that lists batteries by chemistry types and charge rates.

101. (new):

The determining of a nearly-depleted battery of claim 97, wherein said excessively depressed minimum voltage value indicates a potentially unsafe battery.

102. (new):

> The determining of a nearly-depleted battery of claim 101, wherein said determining further includes a means of notifying a user of said potentially unsafe battery.

103. (new):

The method of claim 78, further including a method of determining the chemistry-type of a battery, comprising:

providing a general-purpose processor capable of accessing an analog-to-digital converter for acquiring voltage values of said battery;

providing a means of interconnecting said battery to said A/D converter including a receptacle at said battery for mating to a user-positionable connector plug;

providing a memory to which said processor writes:

> an acquired first value expressing a maximum output-voltage of said battery in a no-load condition;

> a second value being retrieved from a look-up table comprising a substantial matrix of predetermined battery design parameters expressed as both maximum- and minimum-voltage reference values for a multiplicity of battery cells-per-pack configurations arranged by chemistry types;

providing a computer-readable medium embodying program instructions for configuring said processor for performing a comparing of the acquired first value to the retrieved second value as a maximum-voltage reference value, and

said processor analyzes the results of said comparing by determining whether said acquired first value is within a predetermined tolerance range of voltage variance when compared to the retrieved maximum-voltage reference value, thereby said analyzing resulting in either:

accepting said comparing as confirming that both voltage values are
substantially the same, whereupon said processor writes both values to
memory, or

rejecting said comparing because said acquired first value falls outside said
predetermined tolerance range of voltage variance when compared to said
retrieved maximum-voltage reference value, whereupon said processor
discards the rejected maximum-voltage reference value and then retrieves
from among the previously unselected maximum-voltage values in said look-
up table another reference value for repeating said comparing and analyzing
functions;

said retrieving, comparing and analyzing functions repeat until said analyzing results
in an accepting of both the acquired first and retrieved maximum-voltage reference
values, and said processor writes both values to memory;

providing a means of electrically engaging at least one of one or more resistive
elements as a predetermined electrical pre-load temporarily applied to said battery for
said analog-to-digital converter acquiring from said battery a third value expressed as
a minimum output-voltage, said processor then writing said acquired third value to
memory;

providing further program instructions for configuring said processor for retrieving
from said look-up table a fourth value expressing a predetermined minimum design
voltage of a battery of the same cells-per-pack configuration and chemistry type as
that of the previously accepted maximum-voltage reference value, said processor
then writing the retrieved value to memory as a minimum-voltage reference value;

providing additional program instructions for configuring said processor for
performing a comparing of the acquired third value to the retrieved minimum-voltage
reference value;

providing further program instructions for configuring said processor for analyzing
the results of said comparing by determining whether said acquired third value is

within a predetermined tolerance range of voltage variance when compared to said retrieved minimum-voltage reference value, thereby said analyzing resulting in either:

accepting said comparing as confirming that both values are substantially the same, whereupon said processor writes both values to memory, or

rejecting said comparing because said acquired third value falls outside said predetermined tolerance range of voltage variance when compared to said retrieved minimum-voltage reference value, whereupon said processor retrieves from among the previously unselected minimum-voltage reference values in said look-up table another reference value for repeating said comparing and analyzing functions;

said retrieving, comparing and analyzing operations repeat until said analyzing results in an accepting of both the acquired third and retrieved maximum-voltage reference values, and said processor writes both values to memory;

configuring said processor by further program instructions for executing a LIST function comprised of a compiling of the four previously accepted voltage values stored in memory, and

configuring said processor by additional program instructions for performing a SORT function upon the listed values by arranging the four previously accepted voltage values in ascending order,

whereby resulting in only a correctly determined battery chemistry type from among those in said look-up table yielding sorted values listed in a specific sequential order consisting of:

first, the retrieved minimum-voltage reference value;
second, the acquired minimum battery voltage value;
third, the acquired maximum battery voltage value, and
fourth, the maximum-voltage reference value.

104. (new):

The receptacle for mating to a user-positionable connector plug of claim 103, wherein the connector-plug includes a fist position for enabling access of said apparatus to said battery, and a second position for enabling access of said apparatus to a powered device.

105. (new):

The receptacle for mating to a user-positionable connector plug of claim 103, further including a means of controlling the direction of electrical flow strapped across contacts of said receptacle, resulting in said processor having access to both said battery and said powered-device, whereby the need for the connector plug to be user-positionable is eliminated.

106. (new):

The matrix of predetermined battery design parameters of claim 103, wherein said predetermined design parameters substantially represent industry standard values for charge rates, minimum and maximum voltages of individual battery cells, as well as typical battery pack configurations for at least one identifiable category of battery-powered devices.

107. (new):

The category of battery-powered devices of claim 106, wherein said category is derived from analyzing battery voltages and the typical number of cells normally required to power a particular group of substantially similar devices.

108. (new):

The predetermined tolerance range of voltage variance of claim 103, wherein said tolerance range allows for voltage variances caused by either fully-charged or nearly discharged batteries.

RESPONSE TO 102 REJECTION

The Office Action alleges that applicant's claims 52 and 78 are rejected under 35 U.S.C. 102(b) as being anticipated by Krall (US 5,621,299).

Applicant herein submits the following reasoned arguments to overcome the Office Action's rejection. The response is presented in four sections, as follows:

- An overview of the differences in the operational environment of the prior art as compared to applicant's claimed invention, showing physical features of the apparatuses to be substantially different;

- A discussion of the terminology in the subject claims as differentiating applicant's claimed invention from the prior art;

- Detailed reasoned arguments as to the specific objections as cited in the Office Action;

- Summary

Comparative Overview of Operating Environments

In order to fully respond to the 102 rejection, an overview of operational environments that compares the prior art to applicant's claimed invention is presented here to better distinguish the differences in physical features, as well as to show the novelty and unobviousness of applicant's invention over the prior art.

Sketch A depicts a simplified block diagram representing a battery-powered host device to which is attached both Krall's external battery source/"user-adjustable" regulator based on Krall's Fig. 1, and applicant's fully auto-configurable external power supply.

Sketch A

Host Device
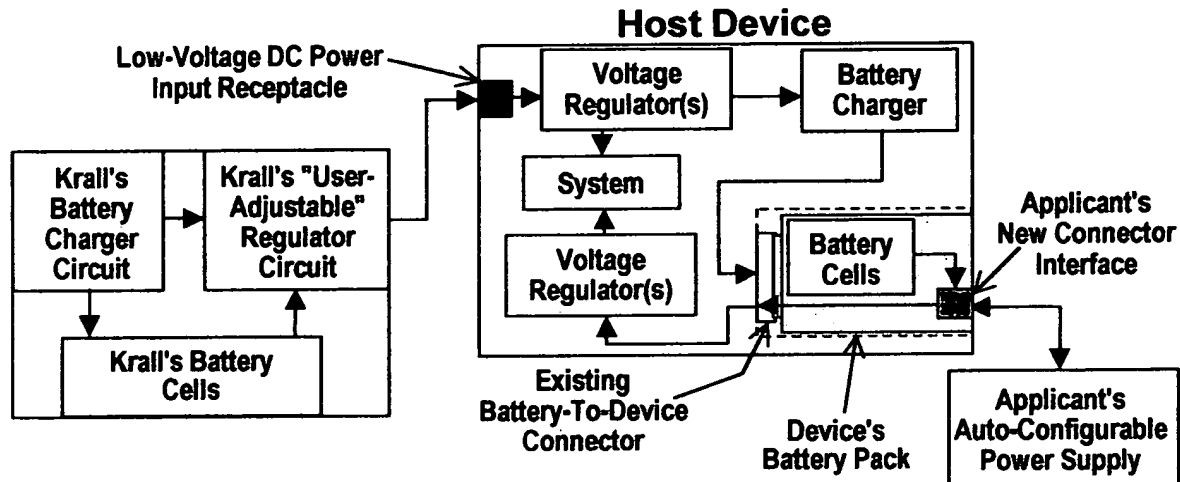
What Krall teaches falls into the category of peripheral devices generally identified as "extended run-time batteries." The basic elements of Krall's battery source/regulator are identified as a cluster of battery cells, serviced by a battery charger. The battery cells are the primary source of power for Krall's "user-adjustable" power-output regulator (Col. 3, lines 65-66). Krall's battery charger circuit can also serve as a power source to the user-adjustable regulator, but only when an input power source (external AC/DC, or DC/DC power-conversion adapter) is attached to the battery charger circuit (Col. 4, lines 49-54).

Before discussing the different features of Krall as compared to applicant's claimed invention, a general comment about the prior art's input power source mode of operation. It does not solve the problem Krall professes his invention overcomes. The problem, as he presents it, is: "It can be very awkward to have to carry separate battery packs and/or power supplies for each of several pieces of portable electronic equipment. Further, if the user desires to be able to operate or recharge each of several pieces of equipment from more than one source, such as from both AC house current and a car battery, for example, it may be necessary for the user to carry two or more separate power supplies and/or types of interconnecting cables for each piece of equipment. . .Therefore, it is a primary object of the present invention to provide an external power supply for such equipment that overcomes these disadvantages to the user" (Col. 1, lines 53-55).

Krall's invention does not solve the problem, because a user now carries an awkward battery so large that it requires considerable room in a briefcase. Also, a user still needs to carry at least one of either an AC/DC or DC/DC power-conversion adapter (Col. 4, lines 59-65). Likely, a typical mobile traveler will carry both, using the AC/DC element in hotel rooms, while the DC/DC adapter is used onboard commercial aircraft (most of which now provide passengers with 15 VDC power outlets at each seat) or in a car.

Compare Krall's bulky apparatus to applicant's universal power supply which, in its external peripheral modality as shown in Figs. 10-11, is no larger than an original manufacturer's power-conversion adapter, but is capable of configuring its output to virtually any mobile device. In its embedded version, as for installation at aircraft seats, a user does not have to carry anything, as all power-delivery circuits, cords, connectors, etc., are already in place, as described in applicant's Specification on Page 3, lines 5-29.

Krall's Batteries Are Problematic

A further downside to using Krall's invention is that his external battery cells require charging. Krall is somewhat vague as to whether both the battery charger and adjustable output-regulator circuits can output sufficient power to simultaneously recharge his invention's battery cells and also be concurrently powering a host device with sufficient current to be charging the device's internal battery cells while also powering the device itself. Such multiple concurrent events are highly probable while traveling, in a situation of a user arrives at a hotel and needs to use the host device, replenish the device's internal battery, and also recharge Krall's external battery cells. One indicator that such a real-world scenario is potentially problematic is that Krall bemoans the fact that ". . .these small power supplies are usually capable of providing only a small current." (Col. 4, lines 57-59).

Krall further has not dealt with issues relating to using his external battery as a means of

charging a host device's internal battery. Krall acknowledges that "Any internal rechargeable battery is charged by supplying power through the same input receptacle." (Col. 1, lines 31-33). Host device's equipped with rechargeable batteries are virtually always configured to prioritize charging these internal batteries. This charging function can account for up to 60% of the power that is available to the host device, and devices cited by Krall, such as laptop computers, handhelds, etc., are all designed to prioritize their internal battery charging functions. Even when a host device's battery is fully charged, the internal battery charger will still turn on for some short period of time in order to "top off" the device's battery. Operationally, Krall's external battery power source is extremely inefficient, because much of Krall's attached battery's energy is being utilized by the attached host device to top off its internal battery. This topic will be covered in greater detail in a later section.

Applicant resolves these issues by electro-mechanically isolating the host device's battery from its internal charging circuit, so that battery charging is an electrically isolated and totally discrete function that can occur simultaneously with (but always independently from) powering a host device.

Applicant's Claimed Invention Resolves Krall's Problem

There is a solution to Krall's dilemma of the precious energy resources stored in his external battery that are wasted by using them to recharge a device's internal battery. Directing Krall's external battery power 11-13 through his power-output circuit 19 then through applicant's new connector interface for delivery to the host device would preserve the prior art's battery resources by eliminating unwanted and energy-inefficient charging of the device's internal battery. This would certainly extend the run time of Krall's battery 11-13. Secondarily, by his apparatus attaching to a host device through applicant's new battery connector, Krall's user-adjustable output-voltage circuit (Fig 7) would have access to the host device's battery for acquiring information about the proper output voltage his allegedly "automatic" configuring. Using applicant's superior interface

would eliminate the need for both his user-adjustable potentiometer, and his even more complex user-directed VOM. Thus, applicant's adapted device's new connector interface solves many of Krall's problems, which not only differentiates it from the apparatus of Krall, but also reveals the advantages of the claimed invention that, until now, were unappreciated by those skilled in the arts, those advantages here including energy conservation, and the elimination of unpredictable user adjustments and potentially incorrect power settings.

Thus, there are major differences in physical features between the prior art of Krall and applicant's claimed invention. Krall teaches attaching his assembly at a host device's existing DC power input receptacle, which approach gives rise to numerous problems associated with that connector interface having no bi-directional access to the device's internal rechargeable battery. The major problems discussed are summarized in the following table:

Problem	Krall's Method	Applicant's Method
User has to transport multiple batteries and power-conversion adapters	User transports awkward and heavy briefcase-size battery and at least one power-conversion adapter	User transports one compact universal power-conversion adapter. In embedded modality, user transports no peripheral items at all
External battery power source requires recharging	Power-conversion adapter must be substantial	No external battery required
Host device's internal battery requires recharging	Valuable external battery resources unnecessarily depleted by mandatory charging of host device's internal battery, resulting in shortened external battery run time	Applicant's claimed invention can eliminate charging host device's battery, if desired.
Information about host device's input voltage requirements desirable in configuring output power signals	User must know host device's power requirements and adjust manually-variable potentiometer accordingly, or user must manipulate VOM to acquire voltage, then manually manipulate potentiometer	By directly accessing battery-to-device I/O connector, unit automatically acquires battery voltage and auto-configures correct device voltage without any user participation

As is now obvious by this comparison of Krall's external long-run battery's operating environment, as compared to that of applicant's claimed invention, applicant's method relies on physical features uniquely different from those taught by Krall. Further, the results achieved by applicant's methods are by comparison, superior to the cited prior art's.

<div align="center">

**Applicant's Claims Terminology
As Applied To Krall's Invention**

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Turning to the specific language of the subject claims 52 and 78, the following discussion of the terminology of those claims, as they allegedly read on Krall, will show that there are even further differences in physical features that distinguish the novelty of applicant's claimed invention over the prior art.

The Office Action specifically alleges that Krall discloses "a method and a computer readable medium for supplying power to a powered device which is adapted to receive power selectably from a battery and a configurable power supply, comprising:"

Applicant's preamble in the subject claims, as quoted above in the Office Action, recites several terms that, in and of themselves or their equivalents, define differences between Krall's invention and applicant's claims. In particular:

- The prior art does not teach "a powered device which is adapted to receive power" [applicant's emphasis]. There is no indication in Krall's description or drawings that any adapting (modifying, etc.) of the host device to which his apparatus delivers power. Instead, he recites: "It is a more specific object of the present invention to provide *a power supply that is adaptable* [applicant's emphasis] for use with a wide variety of types of portable electronic equipment and various types of power sources"(Col. 1, lines 56-59). Applicant's subject claims recite a contrarian approach by adapting a host

device, and achieves superior results thereby, such as selectably accessing either the device's battery or its device, which is the underlying principle of operation in applicant's claims 52 and 78.

Krall actually goes to extreme (and often impractical) measures to seemingly avoid any adaptation of his powered device element. For example, his invention delivers a proper voltage by: "The variable resistor 73 is adjusted by the user to provide the proper voltage at the output terminals 31 for the electronic device that is connected to the output" (Col. 7, lines 26-29). Further, the prior art teaches an even less-practical approach to adjusting the output-power signal of the apparatus: "As an alternative to the fully automated circuit of FIG. 7, a measurement of the voltage and polarity of the battery 109 may more simply be displayed to the user who then, in response, manually makes the voltage and polarity adjustments. In this variation, the controller 91 and switching circuit 93 are eliminated. They are replaced by a voltmeter that is connectable across the output terminals 31 through a momentary contact switch that also simultaneously disconnects the terminals 31 from the rest of the power supply circuit. The circuit of the resistor 71 and the potentiometer 73 (FIG. 1) are retained so that the user may adjust the potentiometer 73 in response to the voltmeter reading. The polarity of the connection of the device 107 to the power supply output terminals 31 is controlled by manually reversing the contacts." (Col. 8, lines 35-50).

Applicant also recites a modality of the claimed invention that provides a user with a manually-selectable voltage dial. However, this unit does not share Krall's risky method of trusting a user to make the correct voltage choice. Instead, applicant's manually-selectable version has "sufficient hardware and software from a power box 400 (Fig. 2B) incorporated so that a user receives a visual indicator -- such as an LED -- to indicate that a correct voltage has been matched on a voltage-indicator dial (see Fig. 13)" (Page 7, lines 25-28).

Applicant's manual version is closely akin to the fully-automatic modality, in that the manually-selectable apparatus already knows the appropriate input voltage requirement of the host device, and "Software 800 in Fig. 1A comprises a method of verifying a manually-set output voltage. . .by acquiring and calculating battery output voltage. Power supply device 400 in Fig. 13 and 13A includes an LED 402 that is capable of blinking, and also holding a continuous LED ON condition. When Vout and Vout^2 are the same, LED 402 goes from a blinking state to a continuous ON state. A continuously ON LED 402 indicates to a user that an accurate voltage match has occurred. This eliminates any mismatched voltage from a power supply 400 which could damage a powered device. With this LED confirmation, a power supply 400 need not have any voltage values demarcated on manually-adjustable voltage selector 337. It is not necessary that a user know what the actual voltage values of a selector 337 are, but user only needs to know that power supply 400 is in a voltage-matched state, irrespective of that actual voltage. Visually defining voltages does, however, offer a psychological advantage, for users who are conversant with voltage matching" (Page 16, lines 4-15). Thus, although there are superficial similarities (only a manually-rotatable selector element) between Krall's apparatus and applicant's, the similarities extend no further, because applicant's adapter unit employs the auto-configuring hardware and software used in all other modalities, which results in far superior performance by eliminating the risks normally associated with letting a user select or adjust anything.

As previously discussed relating to Sketch A herein, Krall is forced to rely on such unreliable user participations because his invention is limited to accessing a non-adapted (unmodified) powered device through a device's existing ". . .low voltage DC power input receptacle," and Krall also acknowledges that ". . .Any internal rechargeable battery is charged by supplying power through the same input receptacle." (Col. 1, lines 31-33).

The problems and limitations of the prior art's apparatus interfacing at this receptacle are pivotal to understanding the novelty and unobviousness of applicant's claimed invention, and its superiority over the cited prior art, so are presented as follows in more detail:

Krall's Interface-Related Problems

The primary problems and limitations in attaching an external source of power to a battery-powered device at Krall's power-input receptacle are:

1. Krall Cannot Access Device Power Requirements

The flow of power signal at a device's power-input receptacle is unidirectional -- *input* only. There is no power signal being output from a non-adapted host device's existing power-input receptacle, therefore, Krall has no access to power-related information about the device available at this connector interface.[1] Host devices of the type described by Krall ("notebook computers, electronic organizers, sophisticated calculators. . . , video cameras and other video equipment. . .telecommunications products, such as telephones, telefax machines. . . , and other types of portable electronic equipment, including radios, television sets and the like"(Col. 1, lines 18-25) all have internal circuitry between the power-input receptacle and the device's internal battery.

Sketch A above illustrates that along the electrical path between the prior

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[1] Others, such as Castleman (US Patent #5,570,002) who adapts a host device by introducing a chip into the device receptacle's circuit, have had no success because there is no practical way to update the millions of legacy devices already in the marketplace. By applicant adaptation being in host device's removeable/replaceable battery packs, older devices are easily updated by simply replacing the battery pack.

art's power-input receptacle and the device's battery cells are at least one voltage regulator. Typically multiple regulators parse the receptacle's input voltage into different voltages for processors, storage devices, peripheral ports, screen displays, etc. In the simplistic example in Sketch A, a battery charger is also shown, because Krall recites a host device so configured (Col. 1, lines 30-33, and Col. 4, lines 9-15). As will be discussed later, Krall erroneously teaches that his apparatus in Fig. 7 represents "The modified output circuit of FIG. 7 is capable of automatically adjusting the polarity and voltage at the output terminals 31 for a class of electronic devices, such as a device 107, that includes an internal battery 109 connected across power input terminals 111" (Col. 8, lines 6-10). In more complex host devices (i.e., those Krall enumerates, including notebook computers, electronic organizers, sophisticated calculators, video cameras and other video equipment, telephones, telefax machines, radios, television sets and the like" (Col. 1, lines 18-25). It is reasonable to expect that there likely are also battery monitoring hardware, hold-up capacitors, keyboard controllers, bridge batteries, and a myriad of other electrical elements that preclude any external peripheral, such as Krall's apparatus attached to a device's power-input receptacle, from accessing a device's internal battery for information about a device's power requirements. For simplicity, Sketch A does not show all of these elements interposed between Krall's input-power receptacle and the host device's internal battery.

Unlike the prior art, applicant's claimed invention does acquire power-related information about a host device's power requirements. Applicant has forged a new path to solve this problem that those skilled in the art assumed previously insoluble, by adapting the host device with a new connector interface that creates an electrical path directly to the adapted device's internal battery. As Sketch A herein and applicant's Figs. 6-6F-1

show, applicant's new connector interface typically resides within a
device's battery housing ("The internal wiring of battery pack 134 has
been reconfigured to include a connector interface. . ." (Page 36, lines 13-
14).

This interface is truly bi-directional, enabling applicant's fully-
configurable external power supply to sample battery cell voltages, and
apply resistive loads to those cells, in order to thereby determine the actual
operating voltages of a host device. As applicant's Specification recites:

"The conductive path created by the insertion of male plug 132 flows
from battery cell(s) 182 along the first conductor 184, to spring contact
176, where the electrical signal is transferred to male plug 132's
conductor 202 (as shown in Fig. 6A) then on to an external power source.

"From battery cell(s) 182, a second electrical path is along conductor
188, then continuing along conductor 18A, where the electrical signal is
transferred to male plug 132's conductor 206 (see Fig. 6A), then on to an
external power source.

"The direction of electrical flow along the paths described above is from
the battery cell(s) 182 to the external power source. This allows software
101 and 800 (Figs. 1 and 1A) in the external power source (or a separate
device) to acquire power-related information, such as a voltage of battery
cell(s) 182. . .Software 100 and 800 (Figs. 1 and 1A respectively) use the
acquired information on voltage (and current if indicated) to configure an
external power supply. . .Once power supply 122 in Fig. 2 has been
configured to a voltage that correlates to that of battery cell(s) 182. .
.When battery pack connector 194 is mated to connector 196 of "system"

(i.e., powered device 136), a power signal from the power source flows into powered device 136" (Pages 37-38).

2. *Krall's Invention Is Energy Inefficient*

Another problem and limitation in attaching Krall's external apparatus to a non-adapted device is that the manufacturer's input-voltage requirement at the Krall's power-input receptacle is invariably higher than the input-voltage requirement at the battery-to-device connector accessed by applicant's device adaptation of a new connector interface (see Sketch A). Device manufacturers specify high input voltages for purposes of electrical efficiency (thinner circuit-board traces, for example), as well as for driving the device's internal battery charging circuitry with a significant enough voltage to charge the battery cells. As recited in applicant's Specification: "A powered device's battery port typically does not accept the same voltage as would the power adapter input jack located elsewhere on the powered device. A powered device that operates on a 12 VDC battery will typically require a higher voltage at its external power port. This is usually dictated by the need to charge the battery pack from a power source that delivers a higher voltage than the battery, itself" (Page 35, lines 19-34).

In the fast-advancing technology of mobile-device power delivery, the prior art is ancient. This is especially apparent in his teachings about device input voltages. Krall describes his external battery as having "six 2-volt lead acid batteries are connected in series to provide a 12-volt battery supply" (Col. 3, lines 49-50). Based on a survey of laptop manufacturers undertaken by the AEEC (Airline Electronic Engineering Committee) and presented as a White Paper to the Cabin Equipment Interfaces (CEI) Sub-committee in 20 January 1998, the data in the chart "Laptop Voltage Boost vs. Buck Comparison" in attached "Exhibit A" clearly indicates that

Krall's 12-volt power source 11-13 driving his power-output circuit 19 would perform inefficient power conversions in situations where device's require inputs above 19 volts. Also, higher output voltages translate to greater power consumption from battery power sources like Krall's, which results in reduced battery run times.

More importantly, the companion chart "Laptop Wattage Increases Over Time" in attached "Exhibit B" reveal that Krall's use of 5-ampere batteries as his invention's primary source of power was a very poor choice even in 1997, the year of his patent's issue. These matters are pointed out here to emphasize that Krall's invention, in light of such a fast-accelerated field as power for battery-operated devices, is ancient, and therefore weak, and should be construed narrowly.

3. *Krall Fails To Consider Inefficiencies From Recharging A Device's Internal Battery*

As previously cited, the prior art's non-adapted host device includes a charger for recharging the device's internal battery (Col. 4, lines 9-14). What Krall fails to take into account is:

- Laptops and other battery-powered devices are designed to prioritize battery charging. Once external power is available at non-adapted device's power-input receptacle, the device's internal charging circuit immediately activates, whether the battery needs charging or not. If the battery is fully charged, the internal charger remains active for only a brief period of time. But, if the host device's battery needs recharging, the device will allocate 20-60% of the available input power to recharging its internal battery.

- In a real-world user scenario, it is not unrealistic to expect a user to first drain the device's internal battery, and only then resort to Krall's external power. This scenario is somewhat obvious because the user would not have to deploy the bulky briefcase (or wrist rest pad) when using smaller handheld-class devices such as mobile phones, calculators, video cameras, or the electronic organizers recited in the prior art (Col. 1, lines 18-25). Also, users might likely eschew Krall's briefcase with larger mobile devices, such as notebook computers, when in use at on-the-road locations such as restaurants/diners, in cabs, while roaming the floor of a tradeshow, etc.

In situations in which a user has significantly depleted a host device's internal battery's capacity, attaching Krall's apparatus to a non-adapted device's input-voltage receptacle immediately initiates charging of the device's internal battery, resulting in significant drain of capacity at the apparatus' external battery cells 11-13. Essentially, Krall's system operates by inefficiently replacing capacity in a host device's battery by depleting capacity in his external battery 11-13. Given the further loss of cell capacity resulting from the previously discussed inefficient power-conversion, the additional battery capacity losses (up to 60%) attributed to recharging the host device's internal battery, the net result is that the prior art's extended run-time battery performs poorly because of these energy inefficiencies.

To put this into quantifiable terms, the prior art teaches that battery source 11-13 is capacity-rated at 5 amps. Assuming that the power-conversion efficiency of Krall's output circuit 19 is 80%[2] (typical for

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[2] Based on a voltage conversion from 12 volts at Krall's battery source to 20 volts at the output The 20-volt number is used here to be consistent with the input-voltage requirement of an IBM 755Cs laptop referenced later.

such circuits circa 1997), and that the device's internal battery charging process requires 60% of the power available at the non-adapted device's power-input receptacle, the following calculation is used:

5 amps x 20% loss for power conversion = 1 amp loss

5 amps - 1 amp = 4 amps remaining

4 amps x 60% loss for device battery charging = 2.4 amps loss

4 amps - 2.4 amps = 1.6 amps remaining

Thus, Krall's 5 amp extended run time battery's capacity is reduced to only 1.6 amps (33%) available for powering the host device.

To put these calculations into practice, the previously-referenced IBM 755Cs laptop (circa 1994, the year that Krall's patent application was filed) indicates its input power parameters to be 20 V @ 2.5A. Using the above calculations, 60% of the current requirement is here deducted for battery charging (1.5 amp), leaving 1.0 amp as the current requirement for powering the laptop's system itself.[3] Thus, at least mathematically, a user of Krall's battery source for powering an IBM 755Cs might expect no more than 1 to 1.5 hours of continuous device operation from his extended run-time battery source.

By comparison, applicant's configurable power supply delivers its power to an adapted host device at its battery-to-device connector that resides in the battery bay (see Sketch A). Because the host device is so adapted, it operates at much lower input voltages when power is delivered to applicant's battery connector interface than the higher voltages required when power is delivered to Krall's power-input

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[3] IBM's external AC/DC power suppply for the 755Cs is labeled to deliver 2.0-3.38A, so the calculated 1.0 amps used in this example may actually be considerably too conservative for determining how long this laptop would operate properly on Krall's extended run-time battery.

receptacle. As recited in the section titled "Adapter Voltages Don't Match Battery Pack Voltages" in applicant's Specification (pages 35-36), ". . .connecting a 12-volt adapter (that matches a battery pack's voltage) to the external power port on a host device may likely deliver a voltage that is insufficient to properly power a device."

The advantages of applicant's adapted device extend to power consumption. As Sketch A indicates, devices operating under battery power utilize different internal voltage regulators. This may or may not be in conjunction with the voltage regulators associated with the device's power-input receptacle but, by and large, device's running under battery power run under either/both hardware and software power management in order to optimize system performance and run time. Thus, a power supply, whether applicant's or Krall's extended run-time battery, benefits from delivering power through that device's battery connector, as compared to delivering the same power through the prior art's power-input receptacle.

The calculations for the prior art's 5 amp battery, which now delivers its power through the battery connector interface of applicant's adapted device, instead of through Krall's power-input receptacle, now produce the following superior power efficiency results:

5 amps x 15%[4] loss for power conversion = 0.75 amp loss

5 amps - 0.75 amp = 4.25 amps remaining

4.25 amps x 0% loss for device battery charging = 0.0 amp loss

4.25 amps - 0 amps = 4.25 amps remaining

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[4] Power-conversion efficiency has been adjusted upward because the IBM 755Cs being used in this example operates with a battery output voltage label-rated at 9.6VDC. For purposes of these calculations, applicant here uses 12-volts as the actual input voltage being delivered top the device-to-battery connector shown in Sketch A.

Thus, Krall's 5 amp extended run time battery's capacity is only reduced to 4.25 amps when powering applicant's adapted device, compared to 1.6 amps when powering the prior art's non-adapted device. Instead of Krall having only 33% of battery capacity for operating the device, applicant's adapted-device method results in 85% battery capacity available.

Further, by combining Krall's power apparatus with the new connector interface of applicant's adapted device, a reasonable case can be made for the prior art's battery 11-13 achieving actual host device run-time performance beyond the above-calculated 85% capacity figure. The device's hardware/software power management capabilities, which were not included in the above calculation, would contribute to further extending actual battery run time. Thus, for the IBM 755Cs laptop used here an example and using the calculation's 1.0 amp current requirement for powering the laptop's system itself, Krall's battery source delivering its power through applicant's connector interface provides a user at least 4 hours of continuous device operation (and perhaps as much as 5 hours if power management is factored in). This compared favorably to the mere 1 to 1.5 hours when Krall's battery source is attached to a non-adapted device's power-input receptacle.

By delivering power more efficiently at the device's battery-to-device connector, applicant's claimed invention achieves results superior to Krall's in power efficiency, especially by eliminating the excessive power required to charge a device's internal battery. There's even a bonus fringe benefit of increased performance for host devices that have battery power management capabilities. These advantages

have, up to now, not been appreciated by those skilled in the art of external power peripherals, although it is inherent in the design and operation of every device that is designed to accept power selectably from either its battery or an attachable power supply.

4. Krall Fails To Address Input-Voltage Tolerances

Applicant's claimed invention further distinguishes itself and shows its superiority over the prior art by solving another problem and limitation of Krall. The prior art does not teach an adjusting of his apparatus' power output circuit 19 (Figs 1 and 7) to deliver a voltage that complies with a host device's specified voltage-input tolerances. Again referencing the laptop device survey presented in the above-cited AEEC/CEI White Paper, the chart labeled "Laptop Voltage-Error Tolerance" in "Exhibit B," details device manufacturers' requirements on allowable variance in device-input voltage. As the chart data shows, allowable input-voltage tolerances at a laptop's power-input receptacle is often amazingly stringent, with one manufacturer (IBM) requiring a zero-voltage tolerance, and eight other manufacturers requiring voltage tolerances of 1-volt or less. Krall's Description makes no reference whatsoever to this issue.

Krall's user-adjustable potentiometer 73 (Col. 5, lines 10-16), which determines the output circuit 19's voltage (Fig 1), or his microprocessor 91 (Fig. 7), need to be designed as sophisticated precision elements. Costly precision resistors might be one approach to ensuring that the apparatus' user-adjustable output-voltage is within a device manufacturer's voltage-tolerance specification.

Another negative factor in the prior art's failure in address non-adapted

device's input-voltage tolerances is that host-device input voltages change dramatically from year to year, and even from model to model in a given year (reference the "Laptop Models By Voltage (1994-1997)" chart in "Exhibit A"). This requires continual and costly updates and modifications to the prior art's potentiometer 73's (Fig. 1) resistive values as new models of host devices are released into the marketplace. The magnitude of such impractical upgrades is apparent in the litany of device classes Krall teaches his apparatus can allegedly adapt to "*notebook computers, electronic organizers, sophisticated calculators, video cameras and other video equipment, telecommunications products, such as telephones, telefax machines, radios, television sets,*" etc. (Col. 1, lines 18-25).

For the prior art's alternate modality that allegedly provides "automatic configuration" of power output circuit 19 (Fig. 7) (Col. 2, lines 45-50), in the context of continual updates to ensure compatibility with an ever-expanding number of new host devices, is so monumental a task as to render Krall's invention inoperative. To put this into some real-world perspective, evidence the extensive six-page list of unique, device-specific power-conversion adapters offered by iGo, a mail order vendor of such peripheral devices ("Exhibit C"). This list is by no means comprehensive, as it does not list all brands of laptops, and it only covers the notebook computer class in Krall's extensive litany of devices his apparatus supposedly can power. It is clearly evident that Krall's assertion that "It is a more specific object of the present invention to provide a power supply that is adaptable for use with a wide variety of types of portable electronic equipment, and various types of power sources" (Col. 1, lines 56-59) is unachievable with the rudimentary apparatuses taught in his Figures and Description.

Comparing Krall's voltage-tolerance problem by using a non-adapted device's existing power-input receptacle with applicant's use of an adapted device's battery connector interface, the input voltage tolerances at a devices battery-to-device connector is amazingly broad. The input voltage range runs the gamut from the device's "shut-down" voltage (the minimum battery voltage threshold that operates the device), to the maximum voltage output by a battery (here considered the design voltage).[5] In an example cited in applicant's Specification, under the heading "Vmin and Vmin" (pages 109-113) a typical 10-cell Ni-Cad pack has a minimum output voltage of 10.0VDC, and a maximum output voltage of 15.0VDC. Thus, applicant's configurable power supply attached to an adapted device's battery-to-device connector can output any voltage in this 5-volt tolerance range whereas, because it is attached to the device's power-input receptacle, while Krall's output circuit 19 would be subject to the device manufacturer's voltage-error tolerance requirement. As the "Laptop Voltage-Error Tolerance" chart in "Exhibit B" clearly shows, the only totally safe voltage-error tolerance that Krall can rely on is a *zero-voltage* error.

5. *Krall Relies On Unpredictable User Skills and Know-How*

Attaching Krall's external source of power to a non-adapted device's power-input receptacle results in another problem/limitation, in that a host device's input-voltage requirements are usually either unknown to a user or, if available, likely confusing. Often the device's power-input requirements are not clearly identified on the label of the device.

Instead, the manufacturer provides this information on label of the external AC/DC (or DC/DC) power-conversion adapter. Unfortunately for Krall, these labeled adapters are the peripheral devices which his invention is supposed to eliminate. As the prior art's Description a asserts as the advantage of his invention:

"Since there is very little standardization of battery and power supply requirements, it becomes very inconvenient when a user is carrying more than one piece of equipment at a time. Each such piece of equipment can require its own special type of battery or battery pack and/or external operating or recharging power supply. It can be very awkward to have to carry separate battery packs and/or power supplies for each of several pieces of portable electronic equipment. Further, if the user desires to be able to operate or recharge each of several pieces of equipment from more than one source, such as from both AC house current and a car battery, for example, it may be necessary for the user to carry two or more separate power supplies and/or types of interconnecting cables for each piece of equipment. There is very little standardization in both the electrical and mechanical (types of plugs, etc.) interfaces with external power supplies.

"Therefore, it is a primary object of the present invention to provide an external power supply for such equipment that overcomes these disadvantages to the user" (Col. 1, lines 54-56).

By allegedly inventing an external one-size-fits-all power source, the use of Krall's invention causes a user to not have the device's original

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[5] In reality, the upper voltage limit can be the anticipated "spike" voltage, which can be 50% above the design voltage, but a given host device may be able to tolerate such voltage spikes only transiently, thus rendering these voltage values as risky to use for continuous operations.

external power supply available which, ironically, is the one item that would likely have label information about the device's input power requirements!

Also, labeling on a device can be confusing to an unskilled user. For example, the device labeling on the IBM 755Cs laptop reads:

$$20V \equiv\equiv\equiv 2.50A$$

However, IBM's supplied external power-conversion adapter is labeled with the following:

$$OUTPUT\ 20\text{-}10V \ \equiv\equiv$$

$$2.00\text{-}3.38A$$

INPUT
SIGNAL   ⊕

G   ⊖
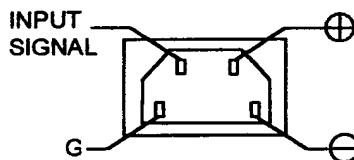
Unless Krall's expected typical user understands the pictogram on the label of IBM's power-conversion adapter, which explains why the external adapter output is indicated as "20-10V," there is considerable risk to Krall's teaching that: "The variable resistor 73 is adjusted by the user to provide the proper voltage at the output terminals 31 for the electronic device that is connected to the output" (Col. 7, lines 25-28).

Krall does recite a modality whereby he alleges that his power-output circuit 19 in Fig. 7 ". . .is capable of automatically adjusting the polarity and voltage at the output terminals 31 for a class of electronic devices, such as a device 107, that includes an internal battery 109

connected across power input terminals 111" (Col. 8, lines 6-10). As
has already been pointed out in the section above titled "Krall Cannot
Access Device Power Requirements," the prior art is flawed by its
erroneous teaching that such a class of electronic devices that includes
a battery connected across power input terminals 111 could exist. Note
that the prior art does not anticipate applicant's claimed invention,
because applicant's internal battery is connected across the device's
battery-to-device connector, not Krall's "power input terminals 111."
Also, previously discussed in the section above titled "Krall Fails To
Address Input-Voltage Tolerances," Krall's power-output circuit 19
(Fig. 7) is further flawed because, even if such a class of devices as
Krall hypothesizes does come to exist, the battery voltage acquired
could not be analyzed in any way to determine the far-different voltage
required at his device's power input terminals 111, nor could such
acquired battery information be used to determine the input-voltage
tolerance as specified by the device's manufacturer. Applicant's subject
claims recite an apparatus (and method) for acquiring battery data,
then the apparatus outputs its configured power signal to the device's
battery-to-device connector. This is described in applicant's
Specification as:

> "A powered device's battery port typically does not accept the
> same voltage as would the power adapter input jack located
> elsewhere on the powered device" (Page 35). Therefore, "Users are
> connecting an external power system to a powered device at its
> battery I/O, and not to the usual power input port. . . ." (Page 35)
> "This allows software 101 and 800 (Figs. 1 and 1A) in the external
> power source (or a separate device) to acquire power-related
> information, such as a voltage of battery cell(s) 182. Software 101
> and 800 use both a Vmin voltage (under load), and a Vmax (no

load). A suitable resistive load is applied in the external power supply to allow a Vmin voltage reading. . .Software 100 and 800 (Figs. 1 and 1A respectively) use the acquired information on voltage (and current if indicated) to configure an external power supply. . ." (Page 37).

As depicted in Sketch A, applicant's device is adapted by the introduction of a new connector interface, which results in the program instructions recited in the preamble of the subject claims having selectable access to a device adapted so as to provide access to the device's internal battery. The accessing is for acquiring battery voltage data and for applying resistive loads to the battery. As applicant's Specification recites on page 62:

" Software 101 in Fig. 1 acquires a battery's voltage in several modes. 'Vmax' 658 is the no-load voltage of a battery, while 'Vmin' 680 is the under-load voltage of a battery. Software 101 can be programmed to look at either or both Vmax or Vmin values, but it must acquire at least one. The selection of Vmax or Vmin is typically not essential. A powered device with a battery source is designed to accept a Vmax voltage, since all batteries have an initial 'pulse' voltage which can be a substantially higher voltage spike than a continuous Vmax. Therefore, matching Vmax [as an appropriate output voltage] is typically acceptable, if only one voltage parameter is to be acquired.

"Vmin, the under-load voltage value of a battery, is acquired in certain applications. The significance of Vmin is that it may, under

certain conditions, also be a viable voltage parameter for an external power supply to match or to use as a basis of a calculation."

Upon analyzing the acquired battery data, the program instructions further determine a battery voltage that is appropriate for the output of an automatically configurable power supply that delivers the configured power signal to the device's battery connector, via applicant's new connector interface. No user adjusting or configuring is required, and Krall's allegedly "automatic" modality does not anticipate applicant's method.

6. *Krall's Acquired Battery-Voltage Information Does Not Enable His Invention To Provide Applicant's Automatic Output Voltage Configuration Power Supply Capabilities*

The prior art recites a modality of the invention that is "capable of automatically adjusting the polarity and voltage at the output terminals 31 for a class of electronic devices, such as a device 107, that includes an internal battery 109 connected across power input terminals 111." (Col. 8, lines 6-10). This reference to a "class of electronic devices" is very vague, and Krall proffers no examples or other substantiation of what such devices specifically are. But, even should such devices actually exist, Krall continues to teach his apparatus' power-output circuit 19 attaching to a non-adapted device's input terminals 111. The prior art's apparatus -- configured as in Krall's Fig. 7 and as taught in his Description, -- is inoperative, because:

- As has been shown, battery output voltages do not correspond with device manufacturers' input-voltage requirements at Krall's

designated input-power receptacle 111. Based on battery chemistry and the way a charging process works, the input voltage at a device's power-input receptacle must be higher than the measured voltage of the battery cells to be charged. Ironically Krall, himself, confirms this non-correlation in discussing the process of charging his apparatus' internal battery cells 11-13: "For a 12-volt battery system, in a specific example, the charging voltage is set for about 15 volts" (Col. 6, lines 11-13).

Applicant has previously cited herein an example of an IBM 755Cs laptop computer with a battery output of 9.6VDC, yet this laptop requires 20VDC at its power-input receptacle. Krall is flawed by teaching that his circuit in Fig. 7 acquires a device's battery-output voltage, thereby enabling his apparatus for "automatically adjusting the. . . voltage at the output terminals" (Col. 8, lines 7-8). This flaw renders this modality of the prior art inoperative.

By comparison, applicant's claimed invention breaks new ground by acquiring voltage information from an adapted device's battery at the existing battery-to-device connector, then the apparatus accesses that same I/O for delivering power to a host device. Applicant's claimed invention is superior to Krall's, because it successfully solves Krall's non-correlating voltages flaw, and because applicant recites a physical feature distinct from Krall teaching (i.e., a device adapted with a new battery connector interface) the Office Action's objection under 35 USC §102 is thereby overcome.

- Applicant has already herein substantiated that a significant

number of device manufacturers[6] require very precise input voltage tolerances, often +/-1 volt. Even if the power-output circuit 19 (Fig. 7) of the subject prior art could glean information about a device's battery, Krall's invention would still not operate, because the prior art fails to teach a solution to the issue of delivering an output signal at a voltage that complies with each device manufacturer's input-voltage error tolerance. Nowhere in the prior art's Description is this issue even acknowledged, and the only referential indication by Krall is his casual approach to voltage tolerances for battery charging, where he states that the output voltage for his charger circuit 17 when charging a 12-volt battery is set "for about" 15 volts (Col. 6, line 12).

Applicant's claimed invention, by comparison, totally avoids any such critical input-voltage parameters by delivering its power signal at an adapted devices battery-to-device interface. As previously discussed, the voltage regulators and other device circuitry downstream of the battery interface of the device are typically designed to operate across the wide voltage ranges that all batteries output. The previous example of a host device equipped with a 10-cell Ni-Cad pack shows that the device will operate with voltages input at its battery-to-device connector in a range between a minimum of 10.0VDC, to a maximum of 15.0VDC (Pages 104-107).

Thus, applicant's apparatus, as recited in the subject claims, uses a new principle of operation in adapting an existing battery-to-device connector of a host device to selectably access a battery and a configurable power supply. In doing so, when delivering power

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[6] The AEEC White Paper data is from a survey of 16 laptop manufacturers (80% responded).

from its configured power supply, applicant's apparatus overcomes the prior art's deficiency of not being able to output a voltage to a device that is compliant with each device-manufacturer's input-voltage tolerance requirements.

Based on all of the above, it is obvious that Krall teaches a flawed method of delivering power, which is based on apparent misconceptions about how his non-adapted host device's are designed, and their power-input requirements. Principally, the prior art's most serious flaw is its reliance on the device's existing input-power receptacle through which to deliver power. This interface is fraught with complexities, problems and, especially with Krall's allegedly "automatically adjusting" power-output circuit 19 (Fig. 7), the prior art's use of a device's input-power receptacle 111 results in an inoperative device. Applicant's subject claims teach a device adapted by a new connector interface that not only overcomes the prior art's limitations, but also provides superior result of a power-delivery apparatus that saves designers and manufacturers R&D costs and time by eliminating the need to research and test compliance with the power-input requirements of virtually every possible host device to which a user might attach Krall's apparatus.

Detailed Discussion Of The Office Action's Cited Objections

Applicant's second area of reasoned argument addresses the terms used in the subject claims 52 and 78 that do not read on Krall, and thus clearly differentiate the two. Throughout this section, the prior art references are construed narrowly because, as has already been shown, they are often vague or weak, and are also very old.

1. Applicant's Device is Adapted; Krall's Isn't

In the previous section, a comparative overview of the operating environments of the two apparatuses pointed out again and again that the paramount differentiator was that Krall's extended run-time battery/user-adjustable regulator supplies power to a *non-adapted* host device, while the preamble of applicant's claims recites ". . .supplying power to a powered device which is *adapted* to receive power. . . ." [applicant's emphasis]

Beyond Krall's previously cited uses of the word "adapt," his other uses of this term (or reasonable equivalents) bear out that he never recites an adapted device:

- "The input circuit is *adapted* to charge the internal battery of the power supply from a variety of input sources of various voltages, both AC and DC, and, in the case of a DC supply, being independent of its polarity" [applicant's emphasis] (Col. 2, lines 13-16).

- "FIG. 7 shows an alternative output circuit for the power supply of FIG. 1 wherein its output voltage and polarity are automatically *adapted* to that of the equipment to which it is attached" [applicant's emphasis] (Col. 3, lines 13-16)

- "An enclosure 113 is *adapted* to hold the thin, flat batteries 11-13. . ." [applicant's emphasis] (Col. 8, lines 52-53)

- "lithium ion batteries. . .can be substituted, provided that the charging portion 17 (FIG. 1) of the system is *adapted* to its unique characteristics" [applicant's emphasis] (Col. 10, lines 25-29).

2. Applicant's Unique Device Adaptation Further Differentiates The Subject Claims From Krall's Invention

The preamble of Applicant's claims 52 and 78 further differentiate the subject claimed invention from Krall. The claims clearly define "a powered device which is *adapted to receive power selectably from a battery and a configurable power supply...*" [applicant's emphasis]. The specificity of what a host device's adaptation is for is clearly spelled out. The adaptation is to enable a device to receive power from either a battery or a configurable power supply, of which each of the two sources of power is *selectable.*

Therefore, according to the preamble of the subject claims, any selecting of power sources -- battery, or power supply -- must occur at the adapted powered device. Applicant's Specification and drawings then clearly define the adaptation at the host device...it is a new connector interface that, by an insertion/retraction of a connector plug (see Figs. 6E-6F-1 and page 95 of the Specification, which "define a non-limiting means of configuring the circuit within a battery 508B with a diode, so that there is only one position for a connector 132."). Or, in another modality, a user performs a sequence of inserting/retracting/rotating/reinserting a connector plug (see Figs. 6B-6C and pages 36-38 of the Specification). Either manipulation of the connector plug causes either the battery or power supply to selectively deliver power to the device. By comparison, Krall's selecting occurs not at a host device, but at his external apparatus. The prior art teaches an that "object of the present invention [is] to provide a power supply that is adaptable for...various types of power sources" (Col. 1, lines 52-56). This power sources are identified as a battery 11-13, and "a variety of input sources of various voltages, both AC and DC" (Col. 2, lines 14-15).

Krall's invention can only be viewed as teaching a host device receiving power from only a power supply, as Sketch B clearly illustrates:

Sketch B

```
┌─────────────────┐
│  Krall's External │
│    AC or DC      │──────┐
│  Power Source    │      │   ╱ ─ ─ ─ ╲       ┌──────────────────┐      ┌──────────────────┐
└─────────────────┘      ├──(   Krall's   )──│     Krall's      │──────│     Krall's      │
┌─────────────────┐      │   ╲ "Selecting" ╱  │ User-Adjustable  │      │   Non-Adapted    │
│  Krall's External │      │    ╲ ─ ─ ─ ╱      │  Power Supply    │      │   Host Device    │
│  Battery Cells   │──────┘                   └──────────────────┘      └──────────────────┘
└─────────────────┘
```
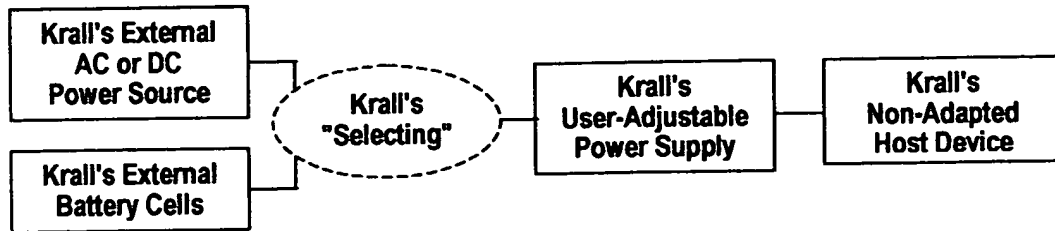
Krall's host device always receives power from his power supply (i.e., power-output circuit 19), and never directly from a battery 11-13, per se. Applicant's subject claims recites a powered device receiving an appropriate voltage "from said configurable power supply, instead of from said battery." Any "selectability" associated with Krall merely addresses whether a user selectably configures Krall's power-output circuit 19 to receive its power from either a battery 11-13, or "input sources of various voltages."

Referencing Krall's Fig. 1, the battery 11-13 as a source of power for his user-adjustable power supply is selected by closing switch 15. To select an alternative source of power, a user attaches either "An external power supply [as] is usually required to interconnect. . .with available AC house current" or "The DC input power will generally be connected with the input terminals 27 through a small transformer and rectifier (not shown) of the type commonly used with portable equipment" (Col. 1, lines 33-35, and Col. 4, lines 49-52).

Sketch C depicts applicant's apparatus, as recited in subject claims 52 and 78:

Sketch C

```
┌─────────────────┐
│   Applicant's    │
│   Configurable   │──────┐
│  Power Supply    │      ┌─┐   ┌──────────────────┐      ┌──────────────────┐
└─────────────────┘      │ │───│   Applicant's    │──────│   Applicant's    │
┌─────────────────┐      │ │   │  New Connector   │      │     Adapted      │
│ Device's Internal │      └─┘   │    Interface     │      │   Host Device    │
│     Battery      │──────┘      └──────────────────┘      └──────────────────┘
└─────────────────┘                        ↖
                                     Applicant's
                                      "Selecting"
```
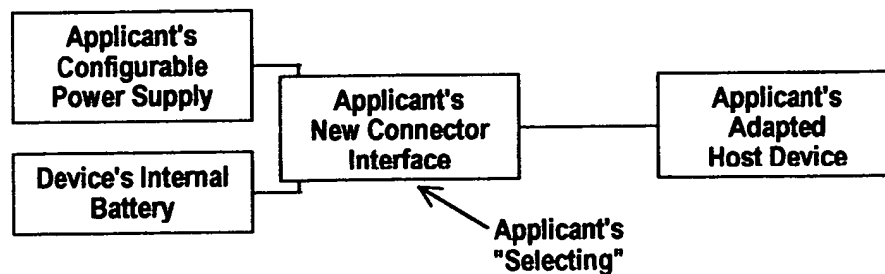
Applicant recites one modality of a new connector interface which enables the selecting of a battery and a configurable power supply in the section of the

Specification titled "Connector Operations" on pages 36-38. This version of the connector interface is essentially ". . .a Y-connector [that] has been created, the base of which is comprised of spring contacts 176 and 178. The two branches of this Y-connector — one of which leads to battery cell(s) 182, and the other branch to powered device 136 — are selectable by positioning the conductive side 202 of a male connector 132 to be electrically attached to one branch or the other." Variants of the connector include a multi-contact rotatable plug and receptacle for apparatus configurations that require manipulating a multiplicity of conductors (Fig. 8) and a user-applied version that enables upgrading devices that use individual battery cells in a holder or cavity (Fig. 7).

Most importantly, Krall's invention teaches no selecting whatsoever at a host device. Further, because Krall's apparatus interposes a user-adjustable power supply between his battery 11-13 (Fig. 1) and a host device, so he does not teach applicant's host device adapted for selectably receiving power directly from a battery. Therefore, applicant's preamble of claims 52 and 78 clearly does not read on Krall.

3. Applicant's Claimed Battery Is Not
The Same As Krall's Battery

The subject claims recite "preloading said battery with a resistive load." "Said battery" here references the selectable battery recited in the preamble. Based on the discussion above as to applicant's host device that is adapted to receive power by a selecting of either a battery or a configurable power supply, then the specific battery is, by common sense, either internal or external to said device. For the limited purpose of a response to the Office Action's allegation that the subject claims are anticipated by Krall, the following references to batteries in applicant's Specification are cited here to illustrate that "said battery" in the instant claims can only be a device's internal battery:

- "By attaching to a powered device's battery pack, the number of connector variants can be specific to battery connections (see Figs. 6A, 6F-, 7, and 8). Another benefit achieved by powering a powered device 136 through its battery port is that a power assembly 100 can easily identify the correct voltage required by a particular powered device. One method of performing a voltage identification is for MCU 102 to sample -- on powerlines 114 and 166 -- the voltage of a battery 134. MCU 102's software 101 executes a process to acquire, and optimize, what becomes the output voltage requirement for configurable power supply 122. MCU 102 then uses that voltage information, sending a voltage-control signal along line 130B to configurable power supply 122" (Page 4).

- "One circuit is to the batteries comprised of traces 264 and 272, while the opposing contacts 266 and 268 electrically create a circuit to host device 284, so that traces 266 and 268 create a circuit that effectively bypasses cells 288. This allows external power sources, such as a power supply and/or battery charger, to operate either simultaneously or independently, to power a powered device 284, and to charge a battery, both functions being performed on the discrete electrical paths created by a flex-connector 250" (Page 52).

- "The hardware and software of a power box 400 can even be integrated into a battery pack, as indicated in Fig. 10, which would result in either the elimination of any external adapters at all, or in a battery pack providing an LED indicator when the correctly matched adapter is in the circuit" (Page 7).

These citations, *a priori*, distinguish applicant's battery in claims 52 and 78 from Krall, who only makes vague references to a host device's internal battery as a source for voltage information in his (as previously discussed, flawed and inoperative) "automatically adjustable" power supply circuit of Fig. 7 (Col. 8,

lines 6-10).

Should one attempt to make a case that applicant's subject claims are to be read so that "said battery" is an external battery, such an interpretation of the claims would still not read on Krall. As discussed in the previous section and its Sketches B and C, Krall's non-adapted host device receives power from his "user-adjustable power supply," and not specifically from his batteries 11-13. The architecture and operational design of Krall's invention require a power supply circuit 19 to be interposed between his battery and a host device, and it is his power supply that is immediately attached to the host device, and not his batteries 11-13. Further, the power signal received by the prior art's non-adapted host device is not of the same voltage as his 12-volt batteries, so it would be straining the reference to allege that Krall's host device is receiving an input-power signal that is the same as (or comparable to) the output-signal of his battery cells 11-13.

Further substantiation that Krall's host device is not receiving power from his battery, per se, is made more obvious by simply viewing Sketch B, which is now modified without his power supply circuit 19 interposed between his battery cells 11-13 and his non-adapted host device, here presented as Sketch D:

Sketch D
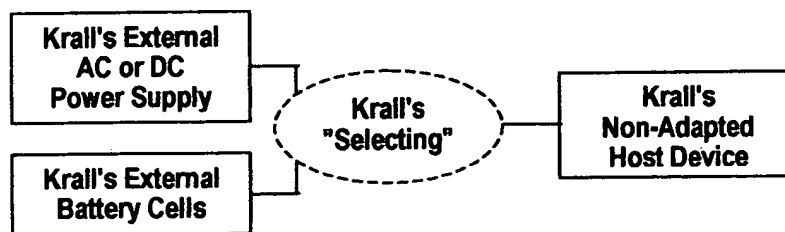
By modifying the original Sketch B by removing Krall's power supply circuit 19, his invention as it now appears in Sketch D becomes inoperative. Although Krall's 12-volt external batteries 11-13 are now attached directly to the power-input receptacle of his non-adapted host device, there is now no element for varying the

battery's output voltage to match the required input voltage of the host device. Thus, it is not the prior art's battery that is selectable to supply power to a non-adapted host device but, instead, Krall teaches a power supply circuit 19 that powers his non-adapted host device. The prior art's battery is only one of three sources of power attachable as power sources at the input-side (upstream) of Krall's output power circuit 19.

Also, Sketch D further supports the above-discussed difference between Krall's external battery and applicant's battery. Sketch D is, by having removed Krall's power supply, nearly an exact representation of applicant's claimed invention in Sketch C.

Sketch C

Applicant's Configurable Power Supply	Applicant's New Connector Interface	Applicant's Adapted Host Device
Applicant's Battery		

Applicant's "Selecting"
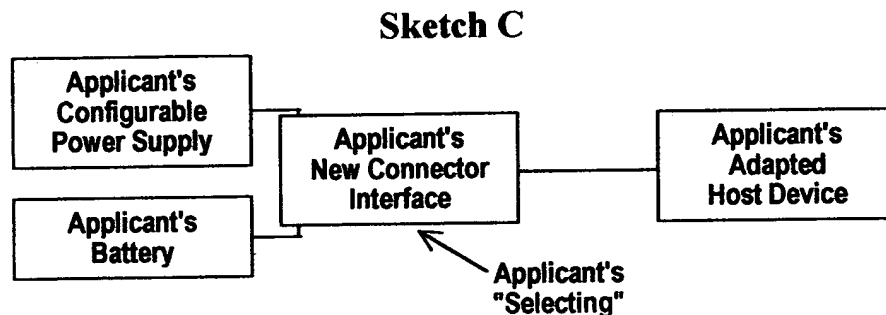
Note that, because applicant's new connector interface delivers power from an external battery directly to a host device -- via the device's existing battery-to-device connector (see Sketch A) -- the hypothetical apparatus depicted in Sketch C is fully operational, while Krall's comparably configured apparatus in Sketch D is inoperative.

4. Applicant's Claims Result In An Outcome Different Than Krall's

Applicant's claims 52 and 78 recite the outcome of their preambles' "computer readable medium embodying program instructions for supplying power to a powered device" as: "thereby supplying *the appropriate voltage to the powered device* from said configurable power supply, *instead of said battery* [applicant's

emphasis]." Clearly indicated in this statement, especially by the qualifying term "instead of," is that the subject battery has a characteristic of outputting an appropriate voltage for delivering power to the device. The instant claims resolve themselves by reciting a battery that is voltage-compatible with the host device, and a power supply which is now configured to also be voltage-compatible, so that these elements are each interchangeable with the other, i.e., the power supply is so configured to be useable *instead of* the battery for supplying the appropriate battery voltage to the device.

Comparing Krall on this issue, the prior art teaches a battery having a predefined voltage that is based on the battery's compatibility with a battery charging circuit 17. No voltage compatibility with any host device is recited in Krall's Description. Further, as indicated in the preceding section's discussion comparing Sketch D with Sketch C, Krall's power output circuit 19 cannot be used *instead of* his battery 11-13. Krall's teaches (in Figs. 1, 7 and throughout the Description) using his battery *with* -- not *instead of* -- his user-adjustable power supply 19.

Thus, applicant's claims 52 and 78 do not read on Krall's apparatus in any of its modalities, because his power supply is not independently selectable instead of his battery. To deliver power, his power supply must always be in the circuit, while applicant's claims recite a true either/or selectability whereby either a battery, or an automatically-configurable power supply, are selected to power a host device.

Resolving The Office Action's Specific Objections

Applicant's reasoned arguments above have brought forth physical differences between Krall's and applicant's claimed inventions to overcome the Office Action's objections. The differences thus far discussed have addressed the preambles and closing clauses of subject claims 52 and 78. In overcoming the Office Action's specific objections, a major difference that has been pointed out is applicant's reciting an adapted host device, while

Krall's device is non-adapted. Applicant's adaptation of a host device being a new connector interface that accesses the device's battery-to-device connector which enables the device to selectably receive power from a battery or configurable power supply, while Krall's battery does not directly power his non-adapted host device but, instead, his battery merely serves as a source of power for an adjustable power supply that delivers the power to his device's existing power-input receptacle.

Also, previous discussions have successfully resolved comparative issues between Krall and applicant's recitations as related to the subject claims' closing clause, showing that applicant's battery has a characteristic distinct from Krall's, the battery having an output voltage compatible with the input voltage of the host device (thus, referentially indicating that applicant's battery is the device's internal battery). Therefore, as applicant's computer readable medium embodying program instructions automatically configures the power supply, both the battery and power supply output voltages to the powered device that render the power supply and battery electrically interchangeable, so that the power supply supplies the power, instead of the device's battery. Krall, by comparison, teaches only a 12-volt battery source that is obviously neither internal to a device, nor voltage compatible with the device. For this and other reasoned arguments already presented, Krall's invention does not teach applicant's claimed device that receives power from a configured power supply, "*instead of* from said battery" [applicant's emphasis].

In the following section, those clauses in the subject claims that are objected to in the Office Action's specific references to Krall's Description and drawings are discussed:

1. Krall's Resistive Load Does Not Anticipate The Subject Claims

Applicant's claim recites: "preloading said battery with a resistive load" and the Office Action alleges that this clause reads on Krall's element 23 in Fig. 1. The instant resistive load 23 in Fig. 1 is defined in Krall's Description for charging his battery power source 11-13. Krall teaches: "Referring to FIGS. 3A, 3B and 3C,

operation of the input circuit 17 of FIG. 1 to charge the batteries 11-13 will be described. . .The charge voltage control circuit 43 preferably includes a comparator which, by monitoring the voltage drop across the resistor 23 during charging, abruptly changes the control voltage in the line 45 when the charging current to the batteries 11-13 falls to a level I.sub.c" (Col. 6, Lines 18-22).

Krall does reference resistive load 23 in a context of delivering power: "The output circuit 19 will now be briefly described. A second DC-to-DC converter integrated circuit chip 65 has an input connected to the node 21 for drawing current from the batteries 11-13 through the series resistance 23. The circuit 65 is also preferably the available part LT1070 described above. An output in a line 67 has a voltage that is selected by a voltage applied to a line 69 from a voltage dividing circuit of a fixed resistance 71 in series with a variable resistance 73. Further, a maximum current draw from the batteries 11-13 is set by a current limiting circuit 75 connected to the chip 65 through a line 77. The variable resistance 73 is preferably in the form of a rotary switch having various fixed resistances connected to it in a manner to allow a step-function incremental increase in the resistance as the switch is rotated in one direction and a similar decrease in resistance as the switch is rotated in the other direction. The values of the resistances are chosen to provide a choice of voltages at the output 31 which correspond to standard battery voltages" (Col. 5, lines 1-19).

Krall's battery only passes its current through the subject resistive load 23, and a separate user-adjustable resistance 73 is employed to determine the output voltage to a host device. Thus, the Office Action's cited reference to resistive load 23 is misunderstood. Krall uses a resistive load 23 in a comparator application of his battery charging circuit and, thus, Krall's resistive element 23 does not anticipate applicant's preloading a battery as a step in a process that results in a determination of an output voltage.

To further show a significant difference between Krall's flawed and applicant's claimed inventions, Krall's variable resistive element 73 is a rotary switch calibrated to output voltages "which correspond to standard battery voltages." As previously discussed in the above-section titled " Krall's Interface-Related Problems," the prior art's apparatus delivers its power output to a host device's existing power-input receptacle. The flaw in Krall's teaching is that device input voltages at this power-input receptacle have no correlation with "standard battery voltages." "Exhibit A" attached hereto shows a chart of "Laptop Models By Voltage (1994-1997)," which represent these devices' required input-voltage. Krall's problem is that the indicated device input-voltages are not representational of "standard battery voltages." During the 1994-'97 period covered by this survey, there were no "standard" laptop battery packs that output voltages of 19-, 20-, or 24-volts. Even more to show the prior art's flawed methods in addressing the operational requirements of laptop devices, the survey chart does not even indicate any laptop whatsoever manufactured over a three year period that would operate from Krall's own "six 2-volt lead acid batteries [that] are connected in series to provide a 12-volt battery supply" (Col. 3, lines 49-50). Again, the evidence points to Krall's invention being flawed and, at least with notebook computers widely available during the time period of Krall's patent prosecution, the distinct reality that Krall's invention was -- and still is -- flawed sufficiently so as to be considered functionally inoperative.

By comparison, applicant's claims 52 and 78 recite a host device adapted to accept its input voltage at its existing battery-to-device connector. This interface does accept device-compliant battery voltages, and these voltages are discoverable by "preloading said battery with a resistive load," as recited in the subject claims. Thus, the objection in the Office Action is overcome by the prior art's apparatus not using a resistive load in a method that leads to determining an output voltage. Instead, a user must adjust a potentiometer to determine Krall's output voltage. By the resistive load of applicant's claimed invention being

applied to a device's battery in order to automatically determine an output voltage, applicant's method is distinctly different than Krall's teachings. This new principle of operation carves a new path for mobile power system designers and manufacturers by providing a simple, user-agnostic method of configuring a power supply for powering virtually any battery-powered device.

2. *The Cited Reference To The Prior Art's*
   Varying A Resistive Load Is Misunderstood

The Office Action alleges that Krall's invention anticipates applicant's subject claims, because applicant's "varying said resistive load on said battery" reads on elements 23 and 43 of Krall's Fig. 1, as recited in Col. 6, lines 18-22.

The Office Action's objection to Krall's resistive load element 23 has already been overcome by the reasoned arguments in the previous section. The Office Action makes specific reference to Col. 6, Lines 18-22 of Krall's Description, citing: "The charge voltage control circuit 43 preferably includes a comparator which, by monitoring the voltage drop across the resistor 23 during charging, abruptly changes the control voltage in the line 45 when the charging current to the batteries 11-13 falls to a level I.sub.c. This is shown to occur at time t1 in FIG. 3B."

And, just as with Krall's resistive element 23 so, too, the cited reference to the prior art's charge voltage control 43 does not teach what the Office Action relies upon. Krall clearly labels element 43 in Fig. 1 as a "Charge Voltage Control" and, therefore, it is evident that a method of charging batteries 11-13 (Fig. 1) is the specifically what the cited prior art is teaching. Since applicant's subject claims recite resistive loads for the purpose of "determining an anticipated fully charged battery voltage," so as to solve the problem of delivering an appropriate voltage to a host device, the apparatus of applicant's claims 52 and 78 does not require or

use a charge voltage control element.

3. The Reference Is Misunderstood As To Applicant's Detecting The Extent Of Voltage Sag Reading on Krall

The Office Action further alleges that applicant's recited "detecting the extent of voltage sag upon preloading said battery" in claims 52 and 78 reads on the prior art. Specifically, the Office Action cites two references to Krall's Description:

> "The charge voltage control circuit 43 preferably includes a comparator which, by monitoring the voltage drop across the resistor 23 during charging, abruptly changes the control voltage in the line 45 when the charging current to the batteries 11-13 falls to a level I.sub.c. This is shown to occur at time t1 in FIG. 3B;" (Col. 6, lines 18-22), and

> "The voltage then remains flat after that time, and the charging current begins to decrease, as shown by FIG. 4B. When that current drops to a threshold level I.sub.c, at which point the comparator within the control circuit 43 switches its output level, the output voltage in line 39 drops to a maintenance level as shown in FIG. 4A." (Col. 6, Lines 56-62).

Again, the above references cited by the Office Action relate to the prior art's battery charging circuits 17, and applicant's claims recite an apparatus (and method) for configuring a power supply to output a voltage, based on analyzing a detected voltage sag consequential to a resistive load having been applied at a battery, and then that load being varied. To overstate the obvious, applicant's claimed battery is not in an active charging state at the time the resistive load is applied, nor is there any direct or indirect reference -- or even inference -- in the subject claim to battery charging.

It is apparent that, both in this and the previous cited references to Krall that are relied on in the Office Action's objections, that applicant's invention is solving a different problem. The problem applicant's claims address is how to determine and supply an appropriate voltage to a battery-powered device, while the cited references to Krall clearly are cited in the prior art's Description as solving a problem of charging a 12-volt lead-acid battery.

4. Applicant's Claimed Analyzing Voltage Sag Does Not Read On Krall

Applicant's subject claims further recite that, upon detecting the extent of voltage sag caused by preloading a battery, the apparatus of Claim 52 (and the method of Claim 78) are then "analyzing said detected voltage sag and determining the anticipated fully charged battery voltage." The Office Action, in alleging that this reads on Krall, relies on Col. 7, lines 22-26 of his Description, which recites:

> "This maximum current is set to be consistent with a maximum
> sustainable current capability of the batteries themselves, and the likely
> current draw of equipment connected to the output terminals 31."

The Office Action clarifies that the above citation from Krall is specific to his recitation regarding "the maximum sustainable current capacity of the batteries themselves."

The clause of the subject claims objected to in the Office Action does not address the issue of the subject battery being analyzed to determine its maximum sustainable current capacity. Instead, the claims recite that the analyzing is for determining the anticipated fully-charge voltage of the battery. Thus, the citation from Krall is misapplied, and applicant's claimed invention is solving a different problem than the Office Action's reference to the prior art (*In re Wright*, 6 USPQ2d 1959 (1988).

Summary

Applicant's response to the Office Action's 102 objections that applicant's claims 52 and 78 are anticipated by Krall has addressed three major areas wherein significant difference in physical features between Krall's and applicant's claimed inventions. The "Comparative Overview of Operating Environments" focused on a simplified depiction of the two apparatuses (Sketch A) to illustrate how each used their elements in different operational configurations. In the section "Applicant's Claims Terminology As Applied To Krall's Invention" the focus was on the specific terms in claims 52 and 78's preambles and closing clauses, with examples of how the terms read on elements of each of the disparate inventions. The final section "Detailed Discussion Of The Office Action's Specific Cited Objections" applicant overcame the 102 with further sketches depicting physical features and configuration differences that distinguish Krall from applicant's claimed invention. Also, throughout the response, numerous examples were cited of problems and flaws in Krall's apparatus, some of which render his invention inoperative. The following is summarization of some of the salient points previously presented, but this summary is not comprehensive, and is not intended to replace the full discussions:

- Krall's invention has not solved the problem it professes to resolve, namely to provide a mobile traveler with an apparatus that eliminates the need to carry multiple power supplies and to carry awkward battery packs and power supplies. But, the apparatus taught by the prior art is large and cumbersomely awkward, and requires transporting at least two power supplies. By comparison, applicant's single compact configurable power supply module solves the problem in a superior way.

- The prior art's apparatus is very energy inefficient, primarily because it wastes its stored battery energy by using these resources to recharge an internal battery of a host device, such recharging operation being inescapable because all devices that have

internal rechargeable batteries automatically commence battery charging when Krall's power is received at the device's power-input receptacle. Applicant's new connector interface adaptation, which electrically attaches to a device's battery-to-host connector, resolves Krall's power-consumption problem by selectably disabling the device's internal battery. The different interfaces for attaching to a host device are a key physical differentiator that it appears repeatedly in applicant's response, and the ramifications for Krall ripple throughout.

• Applicant's subject claims recite "a powered device which is adapted to receive power," but Krall teaches a non-adapted device (i.e., "a power supply that is adaptable). Applicant's contrarian approach results in superior performance, because it resolves a problem in the prior art of requiring a user to manually adjust an output voltage.

• Krall's teaches an apparatus that electrically attaches to a device's existing power-input receptacle, then alleges that in doing so, the apparatus has access to the device's internal battery voltage. This is unsubstantiated by Krall, and applicant's response refutes the prior art's allegation, including a real-world example of a notebook computer, thereby supporting the position that Krall's apparatus is inoperative.

• Applicant shows, by citing a corroborating published survey of mobile devices, that the prior art's teachings are ancient, weak, and should be construed narrowly.

• Applicant expands his prior argument that Krall's apparatus, especially by teaching using a battery as a source of power for a power supply that delivers power to a device that includes an internal rechargeable battery, results in excessive power inefficiencies and produces other unresolved problems and shortcomings. Calculations of battery capacity are used to validate applicant's arguments. Applicant also presents a hypothetical model that describes how the prior art, by delivering its power through applicant's innovative battery connector interface (instead of the

device's existing power-input receptacle as taught by Krall) results in superior power efficiencies and extended run times for Krall's battery. Further evidence supporting applicant's argument that applicant's battery interface improves Krall's battery run time by as much as 85% is presented by applying calculated battery performance data to an actual laptop.

- Unlike applicant's claimed invention that adapts host devices, the prior art is shown to be flawed by its attaching to a non-adapted device's power-input receptacle because Krall's apparatus: 1) does not resolve device manufacturers' input-voltage tolerance issues; 2) requires costly and impractical constant updates to the resistive values of its user-adjustable potentiometer (or its software) every time device manufacturers change their input voltage requirements. Applicant validates these issues with laptop device surveys that reflect these devices during the time period that Krall's application was filed.

- Applicant further expands another flaw in Krall's teachings, focused on the prior art's reliance on unpredictable user adjusting of Krall's variable-resistance potentiometer. Evidence is presented of the input power requirements as presented on the indicia of an IBM laptop and its OEM external power-conversion adapter. Further discussion addresses Krall's allegedly "automatically adjusting" modality of his invention shows that, because the device manufacturer-specified input voltage deliverable at the prior art's power-input receptacle is incalculable from Krall's acquiring a device's internal battery voltage. Applicant's claimed invention eliminates Krall's unpredictable user adjustments. Applicant's claims 52 and 78 resolve the prior art's unworkable dilemma of determining a device's input voltage, by acquiring information directly from a device's battery by means of a new connector interface, then manipulating the acquired voltage value, and analyzing that information to determining a configuration of a power supply that outputs its power signal to the device by accessing the battery-to-device connector.

- Applicant's claimed invention recites an apparatus that *selectably* accesses a device's internal battery and a configurable power supply, and does so by means of applicant's new battery connector interface which -- either manually or without user manipulation -- selects either of these elements as required by the various steps in the program instructions of the apparatus. Krall teaches selecting of his external battery source (not a device's battery), or an external AC/DC (or DC/DC) power source for powering his power-output circuit 19. Therefore, applicant's and Krall's apparatuses have distinctively different physical configurations, as applicant validates through sketches, references to the prior art and applicant's Specification.

- Through citations from Krall's Description, and sketches that compare the two apparatuses, applicant presents reasoned arguments as to why claims 52 and 78 do not read on the prior art. In particular, distinctions between Krall's battery power source and applicant's battery internal to a host device are clarified, to prove that the references cited in the Office Action are misunderstood and, that applying them here strains the subject interpretation.

- Applicant cites the phrase "instead of" as used in his claims 52 and 78 as a clear differentiator between Krall's battery 11-13, which is always used with (and not instead of) his adjustable power supply, whereas applicant's claims recite that the configurable power supply is used instead of the battery.

- Applicant's response further includes a reasoned arguments that address each line of the subject claims cited in the Office Action, the highlights of which include:

  - ◆ Applicant's claimed resistive load does not, as alleged in the Office Action, read on the prior art's resistor 23, because Krall's resistor is part of his battery charging circuit 17, and not his power-output circuit 19. Therefore the reference, as cited, is misunderstood, even though Krall's Description does make one reference to

resistor 23 in the context of the power-output circuit 19, but only to state that the power signal passes through his resistor 23.

◆ Further, applicant provides reasoned arguments that the subject claims recitation of "varying said resistive load on said battery" for determining an output voltage of a configurable power supply is not anticipated by Krall because, again, the Office Action's cited references to the prior art's elements 23 and 43 also are taught by Krall in the context of his charging circuit 17, and not his voltage configuration circuit.

◆ The Office Action's objection to the subject claims recitation: "analyzing said detected voltage sag and determining the anticipated fully charged battery voltage" is overcome by applicant through reasoned arguments that the references to Krall are specific to his teachings about adjusting current to be consistent with the current capacity of his battery power source. But, applicant's claims are solving a different problem, specifically a method of determining an output voltage of a power supply by applying and varying a resistive load to a device's internal battery.

This Summary is not comprehensive, and is not intended -- in and of itself -- to serve as a full response to the objections raised in the instant Office Action. Nevertheless, the highlights presented here do point to reasoned arguments in applicant's full response having successfully overcome the objections to claims 52 and 78 under 35 U.S.C. 102(b) as being anticipated by Krall (5,621,299).

Accordingly, by the above reasoned arguments and cited references and examples, applicant has overcome the objections raised in the Office Action as to claims 52 and 78 being anticipated by Krall. Therefore applicant respectfully requests that the claim rejections under 35 USC §102 be withdrawn.

REMARKS

The Examiner is advised that a Petition for a three month extension of time is enclosed, together with fee based on small entity.

Please acknowledge receipt hereof by stamping and returning the enclosed return postcard.

Applicant is available by phone at (818) 340-7268, or fax at (818) 887-3197.

Enclosed:
    "Exhibit A" (1 sheet)
    "Exhibit B" (1 sheet)
    "Exhibit C" (6 sheets)
    Transmittal Form
    Fee Transmittal
    Petition for Extension of Time
    Check
    Return Postcard

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail #EU662600876US in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

21 AUGUST 2003

(Date of Deposit)

PATRICK H. POTEGA

(Name of Applicant, Assignee or Registered Representative)

(Signature)

8/21/03

(Date)

Laptop Models By Voltage (1994-1997)
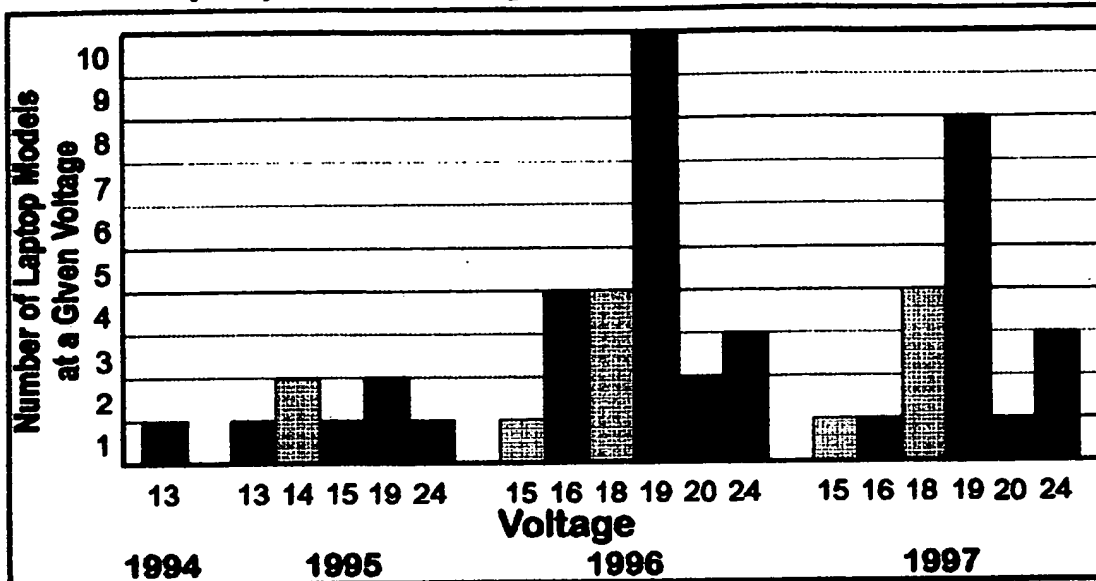
Notes:
Of the respondents, only one manufacturer indicated a voltage for 1994.
For 1995, three manufacturers responded to this question.
For 1996 and 1997, all respondents reported information.

2). Projected or anticipated input voltage of these products for 1998 is:

Laptop Voltage Boost vs. Buck Comparison

Manufacturers (By Voltage Range Across Products)
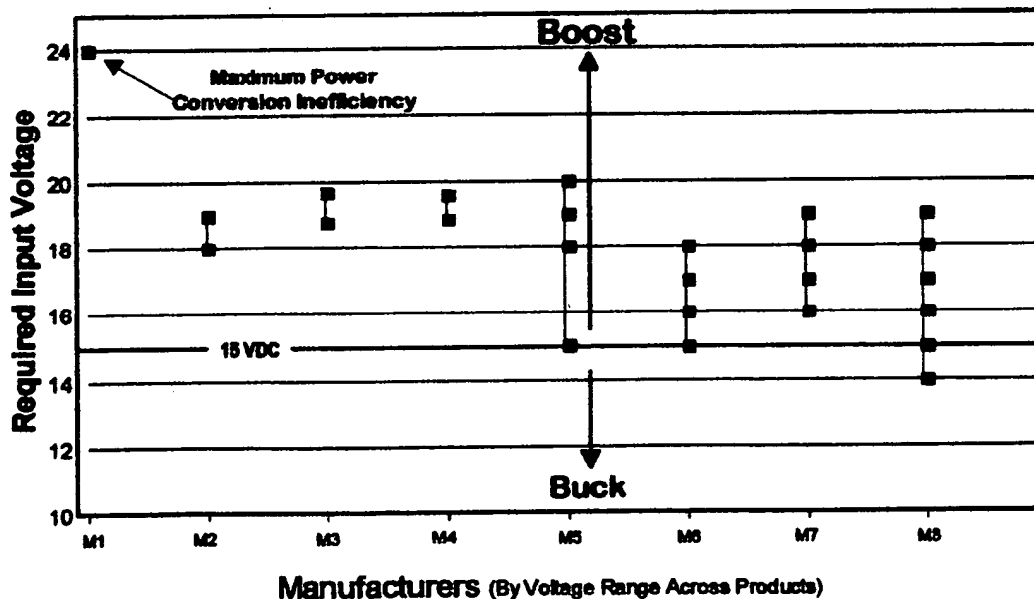
3). What variance on the above target or optimal input voltages to your products will be tolerated without degrading system performance? For example, if your specified input voltage is 15 VDC, is 15 VDC +/- 3 volts acceptable, or must the input voltage be exact? +_____ and -_____ volts above and below the above-specified voltages.

RESPONSE, expressed as the following chart:

Laptop Voltage-Error Tolerance
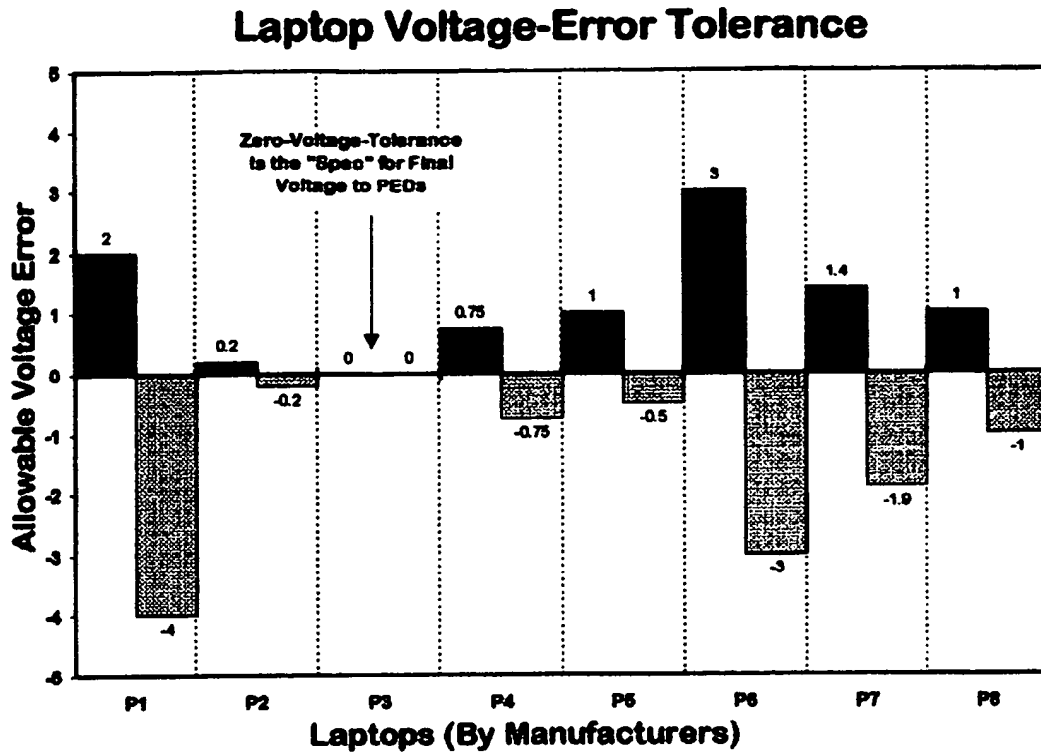
4). Identify the historical wattage of your products (if possible, be product specific, but a wattage range of all products is acceptable):

Laptop Wattage Increases Over Time

HOW TO USE OUR FAST INDEX

Fast Index Key

°50°

Fast Index Key	LiON Battery	NiMH Battery	NiCAD Battery	AC Adapter	Charger	Auto Power Cord DC	Auto EM Power Cord DC	1MB Module	16MB Module	32MB Module	32MB Module	Port Replicator	4.0 GB Hard Drive
Innova 10C, Innova Book 10 Series		4702 $119	4701 $80					CALL		CALL			31229 $399
Innova Book 200LS		8139 $141											31240 $399
Innova Book 350CD, 360CD, 475CDS, 475CDT	21151 $249	11154 $125						21151 $69		CALL			24513 $399
Innova Book 475CDS,475CDT, 300P	21144 $249	11154 $125						21151 $69		CALL			2433 $399
Innova Book 480CDS, 480CDT	3219 $259	23519 $139					23151 $99	27653 $89		CALL		22613 $119	2427 $399
Notejet III, Notejet IIICX P120	9223 $260	11224 $139		1659 $88		14901 $89	22068 $99	CALL		CALL		22627 $115	
												22629 $115	2047 $399
Smartbook V-Pro/Exec		23039 $119						CALL		CALL			3184 $399
Smartbook V-Star, V-Star Plus	20542 $269	22043 $139					22068 $99	CALL		CALL			2409 $399
													2934 $399
Contura Aero 4/25C, Aero 4/33C		2283 $88		2291 $95	5448 $89		22109 $99	6173 $70	2236 $49	CALL		2401 $98	3192 $399
Armada 1100, 1100C, 1120, 1120T, 1125, 1130, 1130T		11188 $89		11182 $75	11189 $89		22650 $99	10774 $85	22581 $89	CALL			31171 $399
Armada 1500, 1560, 1551, 1520, 1530, 1540	21151 $249	21182 $149		24212 $12				21151 $69	2184 $89	21181 $89		2227 $115	3189 $399
Armada 1560, 1570, 1580, 1585, 1590, 1592, 1588, Armada SB	21144 $249	21151 $149		24214 $12				2425 $89	2060 $89	22397 $89		22629 $115	2027 $399
Armada 3500				3214 $12	32116 $139	32105 $119		2407 $99		CALL			2453 $399
Armada 4110, 4110D, 4120, 4125T, 4125, 4130T, 4131T, 4150, 4150T	9213 $79			9213 $79			22069 $89	24109 $125		CALL			2456 $399
Armada 7330, 7330 MT, 7330T, 7350MT, 7360DMT, 7360DMT													2047 $399
7860DMT, 7370DMT, 7800DMT	22357 $259			2387 $99				22381 $89		CALL			3184 $399
Armada 7770, 7710MT, 7730MT, 7730MT	21737 $259			2274 $12				2060 $49		CALL		2230 $115	2069 $399
Armada 7770, 7780, 7782	22695 $259							22060 $89		CALL			2934 $399
Concerto 4/25, 4/33								CALL		CALL			3192 $399
Contura 970, 975, 3/25C, 4/25, 4/25C, 4/25CX		6814 $149		6848 $89	6339 $89	6611 $99	22103 $89	CALL $60		CALL			31171 $399
Contura 400,400C, 400CX, 410C		6469 $119		6387 $75	6339 $89	6678 $89	22057 $88	CALL $89		CALL		6237 $115	2027 $399
Contura 410CX, 420C, 430CX, 430C, 430CX		6369 $89		6387 $75	6339 $89		22040 $99	6391 $89		CALL		6240 $115	2453 $399
LTE 2650 series, 2651 series, 295		6369 $89	1788 $74	1639 $88	2078 $89			4597 $89		CALL			
LTE 2654/720			6336 $189					6386 $89		CALL			2436 $399
LTE 5100, 5100, 5150, 5200, 5250, 5300, 5350, 5400	6602 $260	6697 $139		6603 $89	6636 $79	6391 $88	22305 $89	6945 $75	6275 $89	CALL			2378 $399
LTE Elite 4/40, Elite 4/40C, Elite 4/40CX, Elite 4/60 C,													
Elite 4/50 CX, Elite 4/75C, Elite 4/75CX		10051 $149		5182 $12	4699 $149			10778 $89		CALL			3189 $399
LTE Lite 20, 20C, 20E, 25, 25C, 25E, 4/25C, 4/25E, 4/33C		11094 $128		11692 $179	4698 $169			CALL $125		CALL			
Presario 1010, 1020, 1030, 1060, 1070, 1075, 1080	21718 $219	21171 $140					22387 $89	6528 $89		21075 $125		22431 $115	2027 $399
Presario 1210, 1215, 1220, 1230, 1235, 1255, 1220	20715 $179	21590 $133						6560 $89		CALL			2455 $399
Presario 1260, 1250, 1810	33712 $179	33728 $139		3714 $89				4597 $89		CALL			
Presario 1810, 1820, 1821, 1822, 1825, 1826	33718 $179	22601 $139						6369 $89		CALL			2436 $399
Presario 1840, 1850, 1855, 1860, 1861	22799 $179	22794 $139						6275 $89		CALL			2378 $399
Presario 1710	30168 $260	30167 $139						CALL		CALL			
425E, TS05UC 25	33476 $269	5382 $89	6363 $39				22395 $89	CALL		CALL			2430 $399
Bravo Series, EzBook 400 Series, 400T, 600 Series, 500T		5173 $109		2782 $89				CALL		CALL $85			
EzBook 700MS, 700MT, 744MS, 744MT	20974* $149	26739 $159				20590 $119	26976 $89	CALL $89		CALL		22482 $189	2042 $399
EzBook 770MS, 770LI, 775MS, 772MT, 774MS, 774MT,						14616 $89		1650 $59		CALL			
777MS, 777MT, 750CS		26748 $159		2750 $89		6576 $89	22396 $89	22650 $75		CALL $85			
HiNote VP703, 710, 717, 725, 725, 745				3486 $70	33490 $109			21189 $55		CALL			3129 $399
HiNote VP 500, VP 510, VP 520, VP 535, VP 545,	20974* $149	22646 $145		20577 $89			22242 $139			21189 $55		22642 $159	2431 $399
VP CS5100, VP CTS5100 (* Extra Bay)		6863 $159								CALL			
PC 435K, PC 435SE PC 435SE													3125 $399

HOW TO USE OUR FAST INDEX

Fast Index Key														

Fast Index Key	LION Battery	NiMH Battery	NiCAD Battery	AC Adapter	Charger	Auto Power w/Card DC	Auto Power Power Card DC	1MB Modem	33.6 Modem	28.8 Modem	Port Replicator	U.S. Hard Drive
ThinkPad 755CD, 755CE, 755CSE (AC Auto/Air-flight adapter may NOT charge battery but will power notebook)		8361 $119		20652 $71		8364 $89	22628 $89	CALL	23771 $119	18357 $119	$1247 $399
ThinkPad 755CDV, 755CX, 755CX, 755CX (AC Auto/Air-flight adapter may NOT charge battery but will power notebook)	6386 $222	12879 $159		20655 $79			3042 $89	2782 $100	18359 $149	2772 $179	
ThinkPad 760D, 760L (AC Auto/Air-flight adapter may NOT charge battery but will power notebook)	2536 $99	25406 $159		26176 $79		3040 $89		CALL			
ThinkPad 760C, 760CD, 760E, 760ED, 760EL, 760ELD, 760L, 760LD, 760XD, 760XD, 760XL (AC Auto/Air-flight adapter may NOT charge battery but will power notebook)	18720 $269	16722 $159		16721 $79		16724 $89	2293 $89	CALL $80	CALL $85	18307 $119	Call $399
ThinkPad 760E, 760ED, 760EL, 760ELD, 760L, 760LD, 760XD, 760XD, 760XL (AC Auto/Air-flight adapter may NOT charge battery but will power notebook)	6929 $269	8665 $159		9038 $79		16908 $89	2290 $89	CALL	22407 $95	18309 $119	3399 $399
ThinkPad 770, 770ED	25098 $269			2599 $99			2017 $89	29913 $60	29921 $99		$1251 $399
T8 30A		10721 $139		11382 $110				CALL	CALL		
T8 30AC, AS, AT		30192 $109						CALL	CALL		
T8 30CH, CS, E EP, EP8		29484 $145						CALL	CALL		
Keynote KC60	27721 $189	27720 $119		27719 $89				CALL	CALL		
Keynote KC80, 660	27716 $189	27714 $119		27718 $89				CALL	CALL		
Keynote 800	27772 $189	27723 $129		27724 $109				CALL	CALL		
Metrobook II, III	27128 $178				27430 $119	27432 $99	27433 $139	CALL	CALL	27435 $89	
Metrobook LT	27440 $199				27439 $109			CALL	CALL	27436 $79	
GoBook	2699 $29	8497 $29	6430 $89	2860 $89			2735 $129	CALL	CALL		
Millennia Transport, XPE	2904 $39	4985 $139	2949 $145	2739 $89			2115 $89	CALL	CALL		
Millennia Transport VLX	2745 $119		1088 $89	2572 $89				CALL	CALL		
Millennia XDE	2468 $23			2691 $89			2184 $89	CALL	CALL		
MFX	2805 $29			2749 $89			2651 $129	CALL	CALL		
Trek	2849 $178										
Elite 69/25, TSH25V/25											
Elite Soundbook II, Elite TS50AT, Elite TS50S			683 $119					CALL	CALL		
TS50CS, CH, E EP EP8			1466 $57	1154 $110				CALL	CALL		
FS9A, TS50S				10833 $110				CALL	CALL		
S190		2457 $10	1903 $7					CALL	CALL		
S170SL, S18D, S181		1459 $161						CALL	CALL		
Mobile Pro 250, CU, 450, Tio	2598 $79			2363 $40				CALL	CALL		24677 $99
Mobile Pro 780				2663 $89			2107 $69	CALL	CALL		24675 $99
Ultralite SL/25, SL/25P, SL/25E								CALL	CALL		$1258 $99
Ultralite Versa 25C, 25CE, 25SV, 25C, 25CE, 25CV, 46E;		14685 $119		14894 $125	14620 $99		14689 $99	CALL	CALL		
4400V2/MHz, 80 EC, EV		1557 $119					2113 $89	CALL	CALL		
Ultralite Versa M, Versa P		1567 $119					2115 $89	CALL	CALL		
Ultralite Versa S		1051 $119					2460 $89	CALL	2254 $70		
Versa 6M, 6ND		1971 $10					1459 $70	CALL	CALL		
Versa 6000, 6000H, 6030X, 6030XL, 6030AC, 6030NT, 6060,				697 $148	817 $199	2604 $109		CALL $75	CALL $129		24898 $99
6030AC, 6030XT, 659	818 $210			510 $70			1476 $99	1764 $70			24952 $99
Versa 2000, 2005, 2080, 2085C, 2095C, 2250	813 $208			674 $89	640 $110	9421 $71		1909 $99	1529 $72		24964 $99
Versa 4100, 4400, 4080, 4050H, 4060, 4080, P3 (400)	672 $228			680 $140	2861 $140		2664 $109	CALL	CALL		
Versa 5080, 5188, 5880	2651 $239										

HOW TO USE OUR FAST INDEX

Fast Index Key

Fast Index Key	Li-ION Battery	NiMH Battery	NiCAD Battery	AC Adapter	Charger	Auto Power Adpt Cord DC	Airline Power Card DC	16 MB Module	32 MB Module	64 MB Module	Port Replicator	4 GB Hard Drive
T310DCS/CT												

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Patrick H. Potega, Pro Se	) **RE: RESPONSE TO OFFICE ACTION**
	)
Serial No.: 09/475,945	) Date: 25 November 2003
	)
Filed: December 31, 1999	) Examiner: Zoila E. Cabrera
	)
For: "SOFTWARE FOR CONFIGURING	) Group Art Unit: 2125
AND DELIVERING POWER"	)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTN: Zoila E. Cabrera, Examiner
Art Unit 2125

Informal Amendment For Purposes Of Interview

Examiner Cabrera:

This proposed supplemental reply is in response to the phone communications of 21, 24, and 25 November 2003, regarding the Office Action mailed 21 February 2003 and applicant's response thereto mailed on 21 August 2003.

Applicant proposes that the subject application be amended as follows:

PROPOSED AMENDED CLAIMS

Based on phone communications with the Examiner, applicant herein proposes four potential amended versions of existing independent Claims 52 and 78 as overcoming the Office Action objections under 35 U.S.C. 102(b) for allegedly being anticipated by Krall (US 5,621,299). The four versions are numbered herein distinguishably as variants 52(a) - 52(d) and 78(a) -78(d).

52(a).   (proposed amendment):

A computer readable medium embodying program instructions for supplying power to a powered device ~~which is adapted to receive power selectably from a battery and a configurable power supply~~, comprising:

adapting said powered device for receiving power selectably from a battery and a configurable power supply;

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

78(a).   (proposed amendment):

A method for determining the power requirements of a powered device ~~adapted to receive power selectably from a battery and a configurable power supply~~, comprising:

adapting said device for receiving power selectably from a battery and a configurable power supply;

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

52(b).   (proposed amendment):

A computer readable medium embodying program instructions for supplying power to a powered device ~~which is adapted to receive power selectably from a battery and a configurable power supply~~, comprising:

<u>means of adapting said powered device for receiving power selectably from a battery and a configurable power supply</u>;

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

78(b).   (proposed amendment):

A method for determining the power requirements of a powered device ~~adapted to receive power selectably from a battery and a configurable power supply~~, comprising:

adapting said powered device for receiving power selectably from a battery and a configurable power supply;

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

52(c).   (proposed amendment):

A computer readable medium embodying program instructions for supplying power to a battery-powered device ~~which is adapted to receive power selectably from a battery and a configurable power supply~~, comprising:

adapting said powered device for receiving power selectably from its battery and a configurable power supply;

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

78(c). (proposed amendment):

A method for determining the power requirements of a powered device ~~adapted to receive power selectably from a battery and a configurable power supply~~, comprising:

adapting said powered device for receiving power selectably from its battery and a configurable power supply;

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

52(d). (proposed amendment):

A computer readable medium embodying program instructions for supplying power to a powered device ~~which is adapted to receive power selectably from a battery and a configurable power supply~~, comprising:

modifying said powered device for receiving power selectably from a battery and a configurable power supply;

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

78(d).   (proposed amendment):

A method for determining the power requirements of a powered device ~~adapted to receive power selectably from a battery and a configurable power supply~~, comprising:

modifying said powered device for receiving power selectably from a battery and a configurable power supply;

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

REMARKS REGARDING PROPOSED CLAIMS

Claim Version 52(a) and 78(a)

Applicant proposes the 52(a) and 78(a) variant as a potential amendment to existing Claims 52 and 78. By removing the element in the preamble that recites a powered device "which is adapted to receive power selectably from a battery and a configurable power supply," this element's limitation would be recited instead within the body of the Claim, to more clearly and distinctly show that the adapted device is part of the claimed invention, and thereby should not be construed by its original inclusion in the preamble as an element known in the art.

Applicant submits that the 52(a) and 78(a) variant of proposed amendments to Claims 52 and 78 overcomes the objection under 35 U.S.C. 102 by reciting a powered device that is adapted (modified) in order to receive power. As was clearly shown in applicant's response to the Office Action, as mailed on 21 August 2003, Krall teaches no adapting whatsoever, or even suggests any modifications or changes to his powered device.

Applicant's Specification recites and the Figures show numerous unique adaptations to a powered device, as exemplified by for purposes of this Informal Amendment (but not limited to) various modalities of:

- new connector interfaces (Figs. 6-9D and related description as defined principally throughout the overall Hardware part of the Specification);

- a modulator/demodulator (Figs. 2 and 13A and related description). For example on pages 11-12: "Fig. 2 shows two conductors 114 and 116 that electrically connect hardware assembly 100 to powered device 136, via associated battery pack 134. These two conductors can function as data lines, as well as

powerlines. This would be practical if battery pack 134 is a "smart" battery capable of data communications. Smart batteries, non-limiting examples of which are those defined in the SMBus specifications (available at *www.sbs-forum.org*), can be modified to include a modulator/demodulator for powerline modulation. Also, revisions to the SMBus specifications allow for battery and host data available on a standard PCI bus. Conductors 114 and 116 can be used for powerline modulation, or additional lines can be added (SMBus is a four-wire data bus, and Dallas 1-Wire only requires three).";

- device-resident software (a "Power Monitor" in Fig. 18 and related description). For example on pages 31: " Software 101, and 800 (Figs. 1 and 1A respectively) can be integrated into an MCU, or equivalent processor or controller chips. Since elements of both software 101 and 800 relate to functions or operations not necessarily specific to software embedded into a chip, or processor, some software routines or sub-routines discussed herein can be distributed on media such as diskettes, flash, ROM (CD or DVD, for example), or equivalents. This distributed software can be an application purchased by an end user, and loaded onto a powered device such as a laptop computer, for non-limiting features such as a 'Power Monitor' display.";

- both wired and wireless communications I/Os (Figs. 13-13A and related description). For example on page 11: "Information about the proper input voltage requirements of a powered device 136 (Fig. 2) can also be from data stored in a powered device 136. Powered device's memory 104B (volatile or non-volatile) stores information, which is retrieved by resident software. Through a multiplicity of available data I/O ports at powered device 136, voltage information is delivered to an appropriate I/O port at hardware assembly 100 in Fig. 2. Prior art Figs. 3A and B show a variety of data I/Os at MCU 102. Synchronous, serial, and I^2C data links can be created, as a non-limiting example of data I/Os. Should powered device 136 be capable of storing its voltage and

load requirements as digital data, that data being communicated to hardware assembly 100 by a multiplicity of methods, including but not limited to, powerline modulation, and wireless infrared."

Of the above short list of possible device adaptations, any one (or even combinations thereof) can result in a device receiving power selectably from a battery and a configurable power supply.

As applicant has already shown in the Response to the Office Action of 21 August 2003, Krall does not teach any of these possible device adaptations. Specific to the prior art, there is no reference — or even suggestion by inference — of any adaptations whatsoever to Krall's powered device. Any suggestion, such as that a user being able to reconfigure the prior art's external power source to be a battery or AC/DC (DC/DC) power does not constitute "adapting" the powered device itself.

In today's device environment where device manufacturers continue to produce electronic goods that require their exclusive and dedicated AC/DC and DC/DC power-conversion adapters for devices that increasingly have narrow input-voltage tolerances, applicant's claimed invention — by providing a means of adapting a device (typically by simple modifications as user-installable upgrades) for receiving power selectably from a battery and a configurable power supply — resolves in acquiring a correct input voltage. This forges new ground in solving the problem of automatically delivering a correct and safely-applied device-compliant power signal from an external auto-configuring power supply.

Claim Version 52(b) and 78(b)

Applicant alternatively proposes the 52(b) and 78(b) variant as a potential amendment to existing Claims 52 and 78. The instant element in the preamble of a powered device "which

is adapted to receive power selectably from a battery and a configurable power supply," is in this variant recited instead within the body of the claim as a means + function clause.

By presenting the elements in a means + function clause, this version allows for the various unique adaptations already cited above in the discussion of Claim Version 52(a). Again, since the adapting is directed specifically to the powered device, and not to Krall's external apparatus (nor to a user of the prior art's external apparatus), this proposed variant of the subject claims clearly overcomes the Office Action's objections under 35 U.S.C. 102(b).

Please see further discussion of how this proposed claim reads away from Krall in the Section herein titled "The Prior Art Does Not Teach Preloading Applicant's Battery."

Claim Version 52(c) and 78(c)

As another alternative variant for a potential amendment to existing Claims 52 and 78, Claim Version 52(c) and 78(c) also removes the element of the powered device being adapted from the preamble. In the preamble, the previous reference to "a powered device" now recites instead "a battery-powered device." By further limiting and defining the device by reciting that it is "battery-powered" allows the rewritten first clause in the body of the claim to recite "its battery," i.e., clearly stating that the battery being recited is the battery for powering the antecedent "battery-powered device."

Applicant submits that this proposed rewrite to the subject claims clearly overcomes the Office Action's 102 objections, because it limits the battery to one of the two batteries in the prior art (Krall's external battery 11-13, and the device's "internal equipment batteries" (Col. 7, line 48).

Claim Version 52(d) and 78(d)

As another alternative variant for a potential amendment to existing Claims 52 and 78, Claim Version 52(d) and 78(d) also removes the element of the powered device being adapted from the preamble. The first clause in the body of the claim avoids the use of "adapting" by instead reciting "modifying said powered device. . . ."

As discussed in the section titled "Definition of Terms" of this supplemental response, the word "adapt" already connotes "modify" but, given concerns brought to applicant's attention that the word adapt in the prosecution of a claim somehow can be construed as "able to" is the basis for this proposed version of amended Claims 52 and 78. By this proposed word change, applicant submits that the objections under 35 U.S.C. 102 as to Krall are unambiguously overcome, in that Krall nowhere teaches nor even suggests that his powered device is modified, and that the word modify clearly eliminates any misconstruing of Krall, such as that a user selecting a power source from either Krall's external battery 11-13 or his AC/DC (DC/DC) power sources is thereby somehow adapting the powered device.

In proposing the possible variants above from which Claims 52 and 78 might be amended, applicant submits that any of the proffered claim variants herein are allowable over the cited reference and solicits reconsideration and allowance. If the examiner agrees, but does not feel that the proposed amended claims are technically adequate, applicant respectfully requests that the Examiner write acceptable claims pursuant to MPEP 707.07(j).

Should a proposed amendment to the claims be acceptable to the Examiner, applicant will renumber the proposed amended claims accordingly and rectify all dependent claim numbering references thereto.

The new claims herein submitted contain no new matter, and fall completely within the scope of the material set out in the originally filed documents.

SUPPLEMENTAL RESPONSE TO 102 REJECTION

In addition to the reasoned arguments presented in applicant's response to the Office
Action mailed 21 August 2003, applicant herein submits the following supplemental
reasoned arguments to overcome the Office Action's rejection that applicant's existing
claims 52 and 78 are anticipated by Krall under 35 U.S.C. 102.

Definition of Terms

Applicant herewith attaches a copy of the Merriam-Webster OnLine dictionary's
definition of "adapt" as meaning: "to make fit (as for a specific or new use or situation)
often by modification." Further, in the synonyms section, "adapt" again is defined to
differentiate it from other synonyms as: "implies a modification according to changing
circumstances." As further support for "adapt" as an appropriate and unambiguous word
as used in applicant's existing claims, herewith is also including a page with the related
term "adapter," which is defined in the same dictionary as: "an attachment for adapting
apparatus for uses not orig.[inally] intended."

Thus, given the context and usage of the term "adapt" as used in Applicant's existing
claims as "a powered device which is adapted for receiving power selectably from a
battery and a configurable power supply," the term's appropriateness and usage in light of
its dictionary meaning clearly requires that due consideration be given to an interpretation
that includes modification of the subject powered device, especially since the claim's
phrase describes a specific or new use, that being "for receiving power selectably from a
battery and a configurable power supply."

In light of this dictionary definition, applicant again submits that the prior art does not
teach, nor make any direct or indirect reference, to any adapted (i.e., modified) powered
device. Any interpretation that includes a user's ability to select either Krall's external

battery or his external power supply is, therefore, strained and not supported by the prior art. In such a strained interpretation, a user is adapting (i.e., modifying) not a powered device, but is reconfiguring Krall's external apparatus by manually manipulating the two input power sources (an external battery 11-13, or an AC or DC power source at inputs 29 or 27 of the prior art's apparatus).

This significant difference is easily understood by simply comparing the physical configuration of Krall's powered device. The question is: Is the powered device of the prior art modified in any way so as to enable a user to select Krall's external battery or AC/DC power source? The answer is obvious. . .Krall does not teach that the powered device, itself, requires change or modification in any way so that a user can select either Krall's external battery or his external power supply. No such teaching is to be found anywhere in the prior art. As a matter of fact, Krall's Fig. 1 does not even show a powered device. His Fig. 7 does show a minimalist representation of a powered device 107, but nowhere in the Description is there any reference that supports an adapting (modifying) of that powered device.

The Prior Art Does Not Teach Preloading Applicant's Battery

Applicant further submits that Krall clearly and obviously teaches away from applicant's claimed invention. Applicant's claims recite a preloading of a battery with a resistive load as one of the steps in the overall software-driven process of determining an appropriate input voltage of a device.

In the scant three paragraphs Krall dedicates to teaching his alleged "automatically adjusting the polarity and voltage" (Col. 8, line 7) of his apparatus' output signal, he unambiguously teaches that "substantially no current need be drawn for the purpose of making the voltage measurement, so the result should still be a determination of the voltage input specification of the device" (Col. 8, lines 19-22). However, it is common knowledge that preloading Krall's battery 109 with sufficient electrical resistance to cause

applicant's recited detectable voltage sag would draw substantial battery current. Further, then varying that load, as recited in Applicant's claims, would additionally exacerbate battery current draw. Therefore, this statement by Krall that no battery current need be drawn constitutes a *prima facia* admission that he does not teach any preloading, varying, or detecting of voltage sag, etc., as are recited in applicant's claims.

Thus, this supplemental reasoned argument, along with those presented in the original response to the Office Action, clearly define applicant's claims as not anticipated by Krall, who actually teaches away from applicant's claimed step of preloading a battery. Accordingly, applicant's claimed distinctions are patentable because of the new results achieved and their superiority to Krall, especially:

- Applicant's claimed preloading not only enables the program instructions to determine a fully charged battery voltage, but a secondary beneficial result is that the likely current draw of the equipment connected can be better anticipated. Krall does make a rather vague reference to the "likely current draw of equipment connected to the output terminals" (Col. 7, lines 24-25), but he does not clearly teach how his device's likely load value is ascertained. By applicant's claimed invention reciting a preloading and varying of a battery equivalent to Krall's battery 109 in Fig. 7 of the prior art, the load applied can be configured to simulate the likely current draw of anticipated equipment that will be connected. On page 14 of applicant's Specification: "Fig. 2A details three A/D I/O ports 106, 110, and 112. Each of these is used to acquire powerline voltage (or current), with I/O port 106 reading voltage under a load condition. The load is provided by a power resistor 108 (or equivalent) in powerline 107." This is a significant advantage of applicant's claimed invention over the cited prior art, in that it eliminates any potential ambiguity about the load requirements of any unknown device being attached to an external power-delivery peripheral.

- Krall totally misses another benefit of applicant's preloading and varying the load at a battery. The prior art's alleged UPS function (Col. 7, lines 40-50) would have far superior capabilities if Krall taught applying a load to his internal equipment battery 109 in Fig. 7. Because Krall teaches accessing a battery 109 without applying any load, his invention has no method of determining the charge state or overall operational condition of the device's battery itself.

Krall's not knowing the charge state and overall condition of battery 109 has ramifications for his teaching of his apparatus' alleged viability as an adequate UPS. Krall fails to anticipate devices such as some laptop computers that rely on the device's internal battery as a "bridge" battery, i.e., when the device is in an OFF mode, the equivalent to Krall's 109 battery is relied on to keep CMOS and volatile memory active.

Krall teaches that a user should remove the device's battery, for unscientific (and incorrect) reasons such as that removing the battery from the device "prevents charging process from degrading portable equipment batteries" (Col. 7, lines 51-52). In reality, as explained on page 63 of applicant's Specification: "Battery care and charge/discharge life expectancy are determinants of a valid Vmin. Batteries self-discharge over time. If a battery has not been charge in 30 days, it's under-load output voltage could have gone below its powered device's minimum voltage shut-down value, especially is the battery capacity was nearly depleted when stored. Should the time between recharges become excessive, the battery may be approaching (or have exceeded) its non-recoverable voltage value.

Further, as recited in the section titled "Safely Disabling the Battery" of applicant's Specification: " Also, a number of powered devices, especially laptop computers, have a battery pack that is wired in series with the primary system circuits. The battery pack must not only be present, but operational (often a

reference-voltage circuit is employed) for the powered device to function" (page 39).

Further, Krall's UPS is only reliable when his external batteries 11-13 are charged. If these batteries are the only available power resource because Krall's user has removed the powered device's internal battery 109, and Krall's charge state of his external batteries 11-13 are nearly depleted, then the user's device will inevitably crash. In an even more realistic example, when Krall's battery voltage at cells 11-13 drops to a level where the output circuit 19 can no longer provide a voltage that is within the tolerance requirement of the device, the device will invariably crash.

Applicant's claimed preloading and varying of the load applied to the powered device's battery does, as a secondary result, provide meaningful information about the charge state and operational condition of the device's battery. This information enables such functions as alerts and alarms to the user, so that the user can charge the battery, or replace a weak battery that is nearing its end of life. On page 59 of applicant's Specification recites that the software can "Monitor operational parameters of power sources to determine if the power sources are operating within manufacturers' defined specifications. If a power source's performance drops below defined minimal values, software 101 alerts a user (by a number of indicators) that the power source is deficient. As a non-limiting example, software 101 tracks usage as a function of possible MTBF maturation, so that a user can replace an aged power source with a new one."

Thus, the preloading and varying of a load at the battery of applicant's claimed invention does provide superior performance to a device user, as well as eliminates the risk of a user removing a battery that is required for critical bridge functions, or that is wired in series with the device's system.

Therefore, applicant's claimed distinctions over the prior art overcome the Office Action's 102 objections and the claimed distinctions are of patentable merit under Section 103 because of their new results. Accordingly, applicant submits that this application is now in a full condition for allowance, which action applicant respectfully solicits.

Applicant is available by phone at (818) 340-7268, or fax at (818) 883-5706.

Respectfully submitted,

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Tel: (818) 340-7268
Fax: (818) 883-5706

Encls.   2 sheets with online dictionary definitions

APPLICATION # 09/475,945

3 entries found for **adapted**.
To select an entry, click on it.

adapt
dark adaptation
light-adapted

[Go]

NEW!
Merriam-Webster's
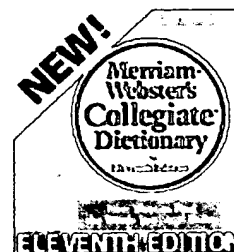Collegiate
Dictionary
ELEVENTH EDITION

Main Entry: **adapt** ◁»
Pronunciation: ə-'dapt, a-
Function: *verb*
Etymology: French or Latin; French *adapter,* from Latin
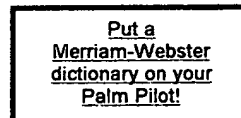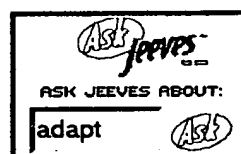*adaptare,* from *ad-* + *aptare* to fit, from *aptus* apt, fit
Date: 15th century
transitive senses : to make fit (as for a specific or new use or
situation) often by modification
intransitive senses : to become adapted
- **adapt·ed·ness** *noun*
synonyms ADAPT, ADJUST, ACCOMMODATE, CONFORM,
RECONCILE mean to bring one thing into correspondence with
another. ADAPT implies a modification according to changing
circumstances <*adapted* themselves to the warmer climate>.
ADJUST suggests bringing into a close and exact
correspondence or harmony such as exists between parts of
a mechanism <*adjusted* the budget to allow for inflation>.
ACCOMMODATE may suggest yielding or compromising to
effect a correspondence <*accommodated* his political beliefs
in order to win>. CONFORM applies to bringing into
accordance with a pattern, example, or principle <refused to
conform to society's idea of morality>. RECONCILE implies the
demonstration of the underlying compatibility of things that
seem to be incompatible <tried to *reconcile* what they said
with what I knew>.

[Dictionary]

[Thesaurus]

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APPLICATION # 09/475/945

One entry found for **adapter**.

Main Entry: **adapt·er** ◀))
Variant(s): *also* **adap·tor** ◀)) /ə-'dap-tər, a-/
Function: *noun*
Date: 1801
1 : one that <u>adapts</u>
2 a : a device for connecting two parts (as of different diameters) of an apparatus **b** : an attachment for <u>adapting</u> apparatus for uses not orig. intended

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Pronunciation Symbols
Click on the example word to hear it pronounced.

\ə\ as **a** and **u** in <u>abut</u>	\e\ as **e** in <u>bet</u>	\o\ as **aw** in <u>law</u>
\ə\ as **e** in <u>kitten</u>	\E\ as **ea** in <u>easy</u>	\oi\ as **oy** in <u>boy</u>
\ər\as **ur/er** in <u>further</u>	\g\ as **g** in <u>go</u>	\th\ as **th** in <u>thin</u>
\a\ as **a** in <u>ash</u>	\i\ as **i** in <u>hit</u>	\th\ as **th** in <u>the</u>
\A\ as **a** in <u>ace</u>	\I\ as **i** in <u>ice</u>	\ü\ as **oo** in <u>loot</u>
\ä\ as **o** in <u>mop</u>	\j\ as **j** in <u>job</u>	\u\ as **oo** in <u>foot</u>
\au\ as **ou** in <u>out</u>	\[ng]\ as **ng** in <u>sing</u>	\y\ as **y** in <u>yet</u>
\ch\ as **ch** in <u>chin</u>	\O\ as **o** in <u>go</u>	\zh\ as **si** in <u>vision</u>

For more information see the <u>Guide To Pronunciation</u>.